DRAINAGE REPORT

FOR

Cedar View Village Addition
Wichita, Kansas

OCTOBER 2007

CITY OF WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer: City of Wichita Date: October 10, 2007

Subdivision Name: Cedar View Village Location: Wichita, Kansas

Total Land Area Of Ownership: 7.6 Acres

Type: _____Residential ✔ Commercial _____Industrial _____Recreation _____Municipal _____Other

Applicant: BGS Companies, LLC Contact: Jeff Bennet Phone #: (316) 928-4052

Engineer: MKEC Engineering Consultants, Inc. Contact: Kara Anderson, P.E. Phone # 684-9600

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development
(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✔		Figure 1.1		
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✔		Tab 1.B		
C. Discussion of offsite conditions	✔		Tab 1.C		
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✔		Tab 1.D		
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	✔		Tab 1.E		
F. Copy of the plat	✔		Figure 1.2		
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✔		Figure 1.3		
H. Professional Engineer seal, signature and date on cover of report	✔		Cover		
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	✔		Tab 1.I		

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	✔		Figure 2.1		
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	✔		Tab 2.B		
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✔		Figure 2.2		
D. Total Site Area and Total Impervious Area (acres)	✔		Tab 2.D		
E. Benchmarks used for site control	✔		Figure 1.2		
F. Streams, creeks, and waterway labeled	✔		Figure 2.3		
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✔		Figure 2.4		
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted	✔		Tab 2.H		
I. Location of existing roads, buildings, parking lots and other impervious areas.	✔		Tab 2.I		

Consulting Engineer Initials _____

J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✔		Tab 2.J		
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔		Tab 2.K		
L. Flow paths	✔		Figure 2.2		
M. Location and dimensions of existing channels, bridges or culvert crossings	✔		Tab 2.M		
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	✔		Tab 2.N		
O. Assumed pre-developed runoff curve numbers	✔		Tab 2.O		
P. Existing time of concentrations used in calculations	✔		Tab 2.P		
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site	✔		Figure 2.2		
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)	✔		Tab 2.R		
S. Cross-section data for open channels	✔		Tab 2.S		
T. Ground water elevations, if applicable	✔		Tab 2.T		

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✔		Tab 3.A		
B. Proposed time of concentrations used in calculations	✔		Tab 3.B		
C. Assumed post-developed runoff curve numbers	✔		Tab 3.C		
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✔		Figure 3.1		
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✔		Figure 3.2		
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities	✔		Figure 3.2		
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary	✔		Tab 3.G		
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✔		Tab 3.H		
I. Design water surface elevations and normal pool elevation for ponds.	✔		Tab 3.I		
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✔		Tab 3.J		
K. Proposed limits of clearing and grading	✔		Tab 3.K		
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✔		Figure 3.1		
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	✔		Figure 3.1		
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔		Figure 3.1		
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	✔		Tab 3.O		

Consulting Engineer Initials _____

P. Preliminary selection and location of stormwater controls	✔		Tab 3.P		
Q. Emergency overflow structure's flow path	✔		Tab 3.Q		
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✔		Tab 3.R		
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✔		Tab 3.S		
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✔		Tab 3.T		
U. Stormwater Management Facilities located within a Reserve	✔		Tab 3.U		
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✔		Tab 3.V		
W. Off-site drainage easements or agreements required, where necessary	✔		Tab 3.W		

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile		✔	Tab 4		
B. Nearest base flood elevations		✔	Tab 4		
C. Delineation of pre-developed regulatory floodplain/floodway limits		✔	Tab 4		
D. Delineation of post-developed regulatory floodplain and floodway limits		✔	Tab 4		
E. Floodplain boundary determination per elevation (project limits shown)		✔	Tab 4		
F. Provide source of floodway data table and discharges		✔	Tab 4		
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		✔	Tab 4		
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✔	Tab 4		
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		✔	Tab 4		
J. Flood plains and floodways located within a Reserve, where necessary		✔	Tab 4		

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		✔	Tab 5.A		
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		✔	Tab 5.B		
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✔	Tab 5.C		
D. Kansas Department of Transportation		✔	Tab 5.D		
E. Sedgwick County Right-of-way Permit		✔	Tab 5.E		

Consulting Engineer Initials _____

Tab 1. Project Narrative

A. Location

The site is between the Kansas Turnpike (I-35) and Lincoln Road, east of Greenwich Road in the south half of the northwest quarter of Section 27, Township 27 South, Range 2 East. The site is shown on the USGS Map, Figure 1.1.

B. Discussion of Development

The site is currently open space. Approximately 7.6 acres will develop as residential lots. An existing dry detention pond on the site will be moved east of the development.

C. Discussion of Offsite

Adjacent plats include Woodland Lakes Community Church (west), Seltzer Elementary School (east) and the Windsor Park Addition (south). Runoff from the school and the church flows into the proposed site.

D. Summary of Runoff

The post project site will drain into the proposed dry detention pond located east of the development. This pond will also receive runoff from the adjacent Seltzer Elementary School and Woodland Lakes Community Church. Approximately, 1.5 ac-ft of detention will be provided in the dry detention basin. An area inlet with a 12-foot perimeter, a 36" storm sewer pipe and four 5"x3" openings will control flow from the detention basin. As shown in the table below, with the proposed detention, basin post-development flow rates are less than pre-development flows.

Comparison of Pre and Post-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-project Pond Discharge	27	40	49	60	77
Post-Project Pond Discharge	25	40	48	60	76

E. Best Management Practices

Detention facility side slopes will not exceed 3:1 (H:V). The site will be seeded or sodded after construction of grading and utilities are complete. The outlet structure of the dry detention basin will be protected against erosion.

F. Plat

The plat is included, Figure 1.2.

G. Preliminary Grading Plan

The preliminary lot grading plan is included, Figure 1.3.

H. Professional Engineer Seal

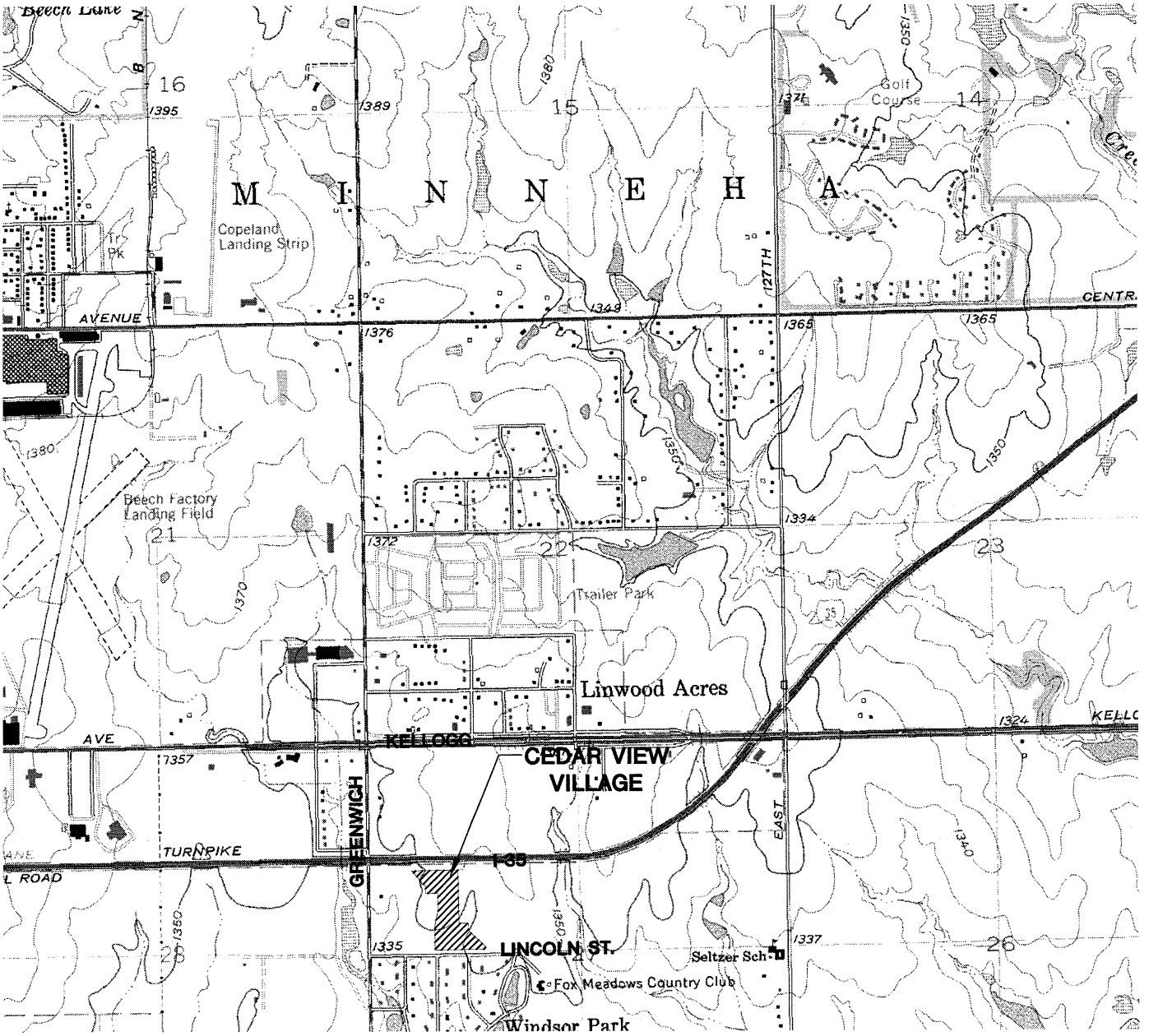
The cover of the report will be signed and dated.

I. CD

A CD of the drainage report in PDF format is attached to the inside front cover of the bound report.

Figure 1.1

USGS Quadrangle Map



N

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

J:\Civil\06189\dwg\drng\06189QUAD.DWG

MKEC ENGINEERING CONSULTANTS, INC.

411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

CEDAR VIEW VILLAGE
PROJECT NAME

WICHITA KS QUADRANGLE
SHEET TITLE

AJF	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
OCTOBER 2007	06189	1 / 1
DATE	JOB NO.	SHEET/OF

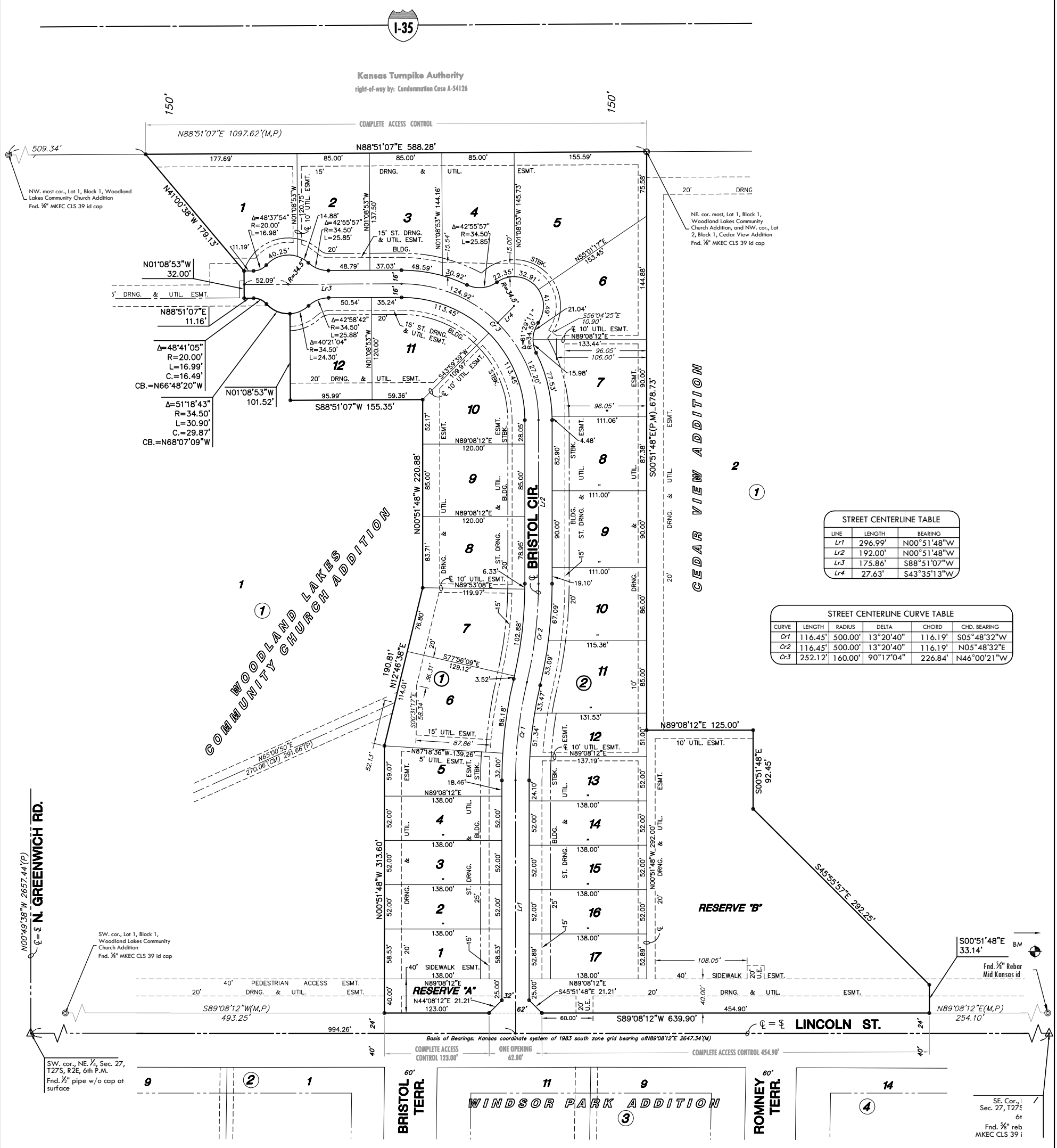
Figure 1.2

Plat

FINAL PLAT

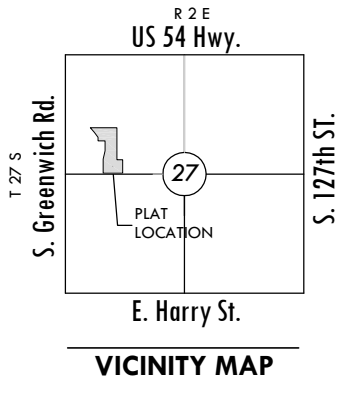
CEDAR VIEW VILLAGE ADDITION

AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

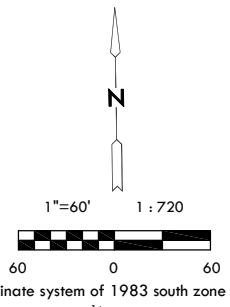


STREET CENTERLINE TABLE		
LINE	LENGTH	BEARING
Lr1	296.99'	N00°51'48"W
Lr2	192.00'	N00°51'48"W
Lr3	175.86'	S88°51'07"W
Lr4	27.63'	S43°35'13"W

STREET CENTERLINE CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CHD. BEARING
Cr1	116.45'	500.00'	13°20'40"	116.19'	S05°48'32"W
Cr2	116.45'	500.00'	13°20'40"	116.19'	N05°48'32"E
Cr3	252.12'	160.00'	90°17'04"	226.84'	N46°00'21"W



VICINITY MAP



Basis of Bearing: Kansas coordinate system of 1983 south zone grid bearing of N89°08'12"E along the S. Line of SW. ¼, Sec. 27, T27S, R2E, 6th P.M.

LEGEND

Date of Survey: May, 2007

- △ = Section Corner Monument Found
- ◎ = Found Survey Monument See annotation
- ◉ = Set ⅝" Bar w/ MKEC CLS 39 id. cap
- (M) = Measured
- (P) = Platted
- (D) = Described or record description
- $ = Section line

BENCH MARK

BM#1 Square cut on east end of north headwall of RCB 31' east and 11 feet north of the center of Sec. 27 T27S, R2E.
Elev. = 1346.58 NGVD 29

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

FINAL PLAT
CEDAR VIEW VILLAGE ADDITION
AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

CERTIFICATE OF SURVEY

I, Gregory J. Allison, a registered land surveyor in Kansas, do hereby certify that I have been in responsible charge of surveying and platting of "CEDAR VIEW VILLAGE ADDITION", an addition to Wichita, Sedgwick County, Kansas, into Lots, Blocks, Reserves, and Streets, the same being accurately set forth in the accompanying plat and described herein:

A replat of a contiguous tract of land lying in the a portion of Lot 1, Block 1, Woodland Lakes Community Church Addition, an addition to Wichita, Sedgwick County, Kansas; AND ALSO, all of Reserves "F" and "G" and a portion of Lot 2, Block 1, Cedar View Addition, an addition to Wichita, Sedgwick County, Kansas, said contiguous tract of land being more particularly described as follows: COMMENCING at the southwest most corner of said Lot 1, Block 1, Woodland Lakes Community Church Addition, thence along the south line of said Lot 1, on a platted basis of bearing, Kansas coordinate system of 1983 south grid zone of N89°08'11"E, 493.25 feet to the POINT OF BEGINNING; thence N00°51'48"W, 313.60 feet; thence N12°46'38"E, 190.81 feet; thence N00°51'48"W, 220.88 feet; thence S88°51'07"W, 155.35 feet; thence N01°08'53"W, 101.52 feet to a point on a non-tangent curve to the right; thence along said curve 30.90 feet to a point on a curve to the left, said non-tangent curve to the right having a central angle of 51°18'43", a radius of 34.50 feet, and a long chord distance of 29.87 feet, bearing N68°07'09"W; thence along said curve to the left 16.99 feet, said curve to the left having a central angle of 48°41'05", a radius of 20.00 feet, and a long chord distance of 16.49 feet, bearing N66°48'20"W; thence S88°51'07"W, 11.16 feet; thence N01°08'53"W, 32.00 feet; thence N41°00'38"W, 179.13 feet to a point on the north line of said Lot 1 being coincident with the south line of Kansas Turnpike Authority right-of-way as condemned by Case A-54126, and said point lying 509.34 feet east of the northwest most corner of said Lot 1; thence along said north line, N88°51'07"E, 588.28 feet to the northeast most corner of said Lot 1, being coincident with the northwest most corner of said Lot 2, Block 1, Cedar View Addition; thence along the common line to said additions, S00°51'48"E, 678.73 feet; thence N89°08'11"E, 125.00 feet; thence S00°51'48"E, 92.45 feet; thence S45°55'57"E, 292.25 feet; thence S00°51'48"E, 33.14 feet to the south line of said Lot 2, Block 1, Cedar View Addition; thence along the south lines of said additions, S89°08'12"W, 639.90 feet to the POINT OF BEGINNING.

All reserves, streets, utility easements, building setbacks, and access controls, together with all other public dedications within the above described property are hereby vacated and replatted by virtue of K.S.A. 12-512(b).

I hereby certify that the details of this plat are correct to the best of my knowledge and belief this ___day of _____2007.

Gregory J. Allison, PE, LS #1257
MKEC Engineering Consultants, Inc.
411 North Webb Road
Wichita, Kansas 67206

Know all men by these presents that we the undersigned property owners of the land above set forth in the Registered Land Surveyor's Certificate, have caused the same to be surveyed and platted into Lots, Blocks, Reserves, private and public Streets the same to be known as "CEDAR VIEW VILLAGE ADDITION," an addition to Wichita, Sedgwick County, Kansas.

Easements for the construction and maintenance of public utilities and public sidewalks, as indicated on the accompanying plat are hereby granted to and for the use of the public.

The public streets are hereby dedicated to and for the use of the public. An emergency access opening is platted along the west end of Bristol Circle.

All reserves are plated for drainage, utilities confined by easements, berming, landscaping, irrigation, monuments, fountains, and walkways. All of the the Reserves shall be owned and maintained by the developer and or a Home Owner's Association and are reserved for the stated uses.

A drainage plan has been developed for this plat and all drainage easements, right-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of storm water.

OWNER'S CERTIFICATE

WOODLAND LAKES COMMUNITY CHURCH INC., a Church of the Nazarene

_____, Chairman
Rod Thelander, Chairman

STATE OF KANSAS, SEDGWICK COUNTY} ss:

This instrument was acknowledged before me on ____ day of _____ , 2007, by Rod Thelander, Chairman, Woodland Lakes Community Church Inc., a Chruch of the Nazarene .

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

_____, Notary Public
Notary Public:

SEAL
My Term Expires: _____.

UNIFIED SCHOOL DISTRICT 259

_____, President
Sarah Skelton, President
Board of Education

STATE OF KANSAS, SEDGWICK COUNTY} ss:

This instrument was acknowledged before me on ____ day of _____ , 2007, by Sarah Skelton, President, Board of Education, Unified School District 259.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

_____, Notary Public
Notary Public:

SEAL
My Term Expires: _____.

PLANNING COMMISSION CERTIFICATE

This plat of "CEDAR VIEW VILLAGE ADDITION" has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this ____ day of _____ , 2007

WICHITA-SEDGWICK COUNTY METROPOLITAN AREA PLANNING COMMISSION

_____, Chair
Darrell A. Downing, Chair

Attest:

_____, Secretary
John L. Schlegel, Secretary

Affix MAPC Seal

GOVERNING BODY CERTIFICATE

The dedications shown on this plat are hereby accepted and this plat is hereby approved by the governing body of the City of Wichita, Kansas.

Dated this ____ day of _____ , 2007

At the direction of the City Council.

_____, Mayor
Carl Brewer, Mayor

Attest:

_____, City Clerk
Karen Sublett, City Clerk

Affix City Seal

TRANSFER RECORD

STATE OF KANSAS, SEDGWICK COUNTY} ss:

Entered on transfer record this ____ day of _____ , 2007

_____, County Clerk
Don Brace, County Clerk

Affix County Clerk Seal

REGISTER OF DEEDS CERTIFICATE

This is to certify that this instrument was filed for record in the Register of Deeds office this day of _____ , 2007, at _____ o'clock _M; and is duly recorded.

_____, Register of Deeds
Bill Meek, Register of Deeds

Attest:

_____, Deputy
Tonya E. Buckingham, Deputy

Affix Register of Deeds Seal

COUNTY SURVEYOR

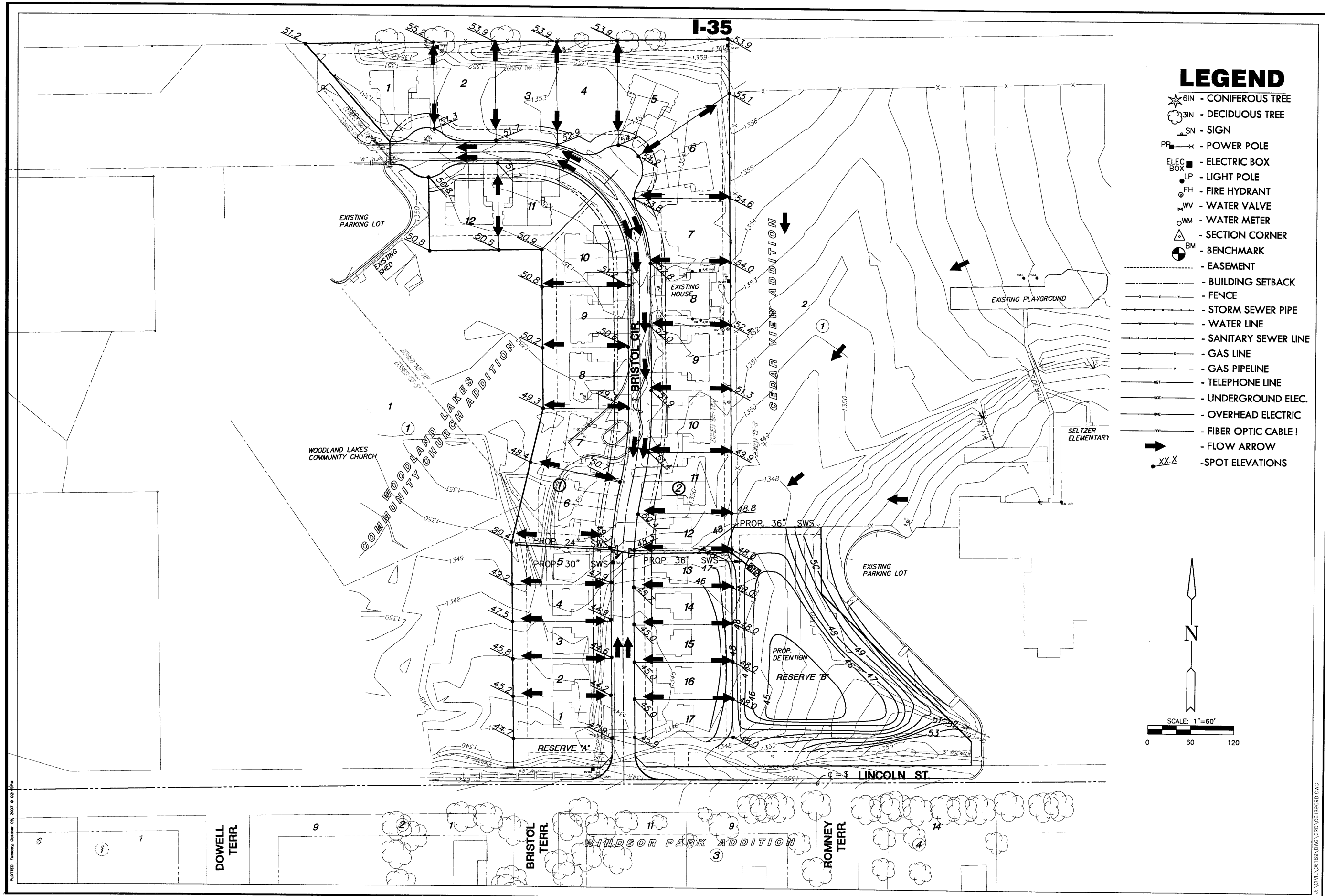
Reviewed in accordance with K.S.A. 58-2005 on this ____ day of _____ , 2007.

_____, Deputy County Surveyor
Tricia L. Robello, LS #1246
Deputy County Surveyor
Sedgwick County, Kansas

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

Figure 1.3

Preliminary Grading Plan



LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- - SECTION CORNER
- BM - BENCHMARK
- - EASEMENT
- - BUILDING SETBACK
- - FENCE
- - STORM SEWER PIPE
- - WATER LINE
- - SANITARY SEWER LINE
- - GAS LINE
- - GAS PIPELINE
- - TELEPHONE LINE
- - UNDERGROUND ELEC.
- - OVERHEAD ELECTRIC
- - FIBER OPTIC CABLE !
- - FLOW ARROW
- XX.X -SPOT ELEVATIONS

N

SCALE: 1"=60'

0 60 120

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

PRELIMINARY NOT FOR CONSTRUCTION

LOT GRADING PLAN
CEDAR VIEW VILLAGE

GRADING PLAN
SHEET TITLE

06189
PROJECT NUMBER

AF , CMJ , KLA
DESIGNED DRAWN CHECKED

ISSUED
October 2007

REVISED

SHEET NO.
1 OF 1

PLOTTED: Tuesday, October 09, 2007 @ 02:18PM

K:\CNL\06189\DWG\GRG\06189GRD.DWG

Tab 2. Existing Conditions Runoff Calculations

A. Orthophotograph

The aerial photograph is included, Figure 2.1.

B. Runoff Method

The site was modeled using the SCS Hydrograph method in Hydraflow Hydrographs 2007 by Intelisolve.

C. Existing Topography

Slopes across the site ranged from 1%-3%. A dry detention pond is located in the southeast corner of the property. Elevations on the site ranged from 1359 feet to 1345 at the pond outlet. The existing topography is shown on the Existing Conditions Drawing, Figure 2.2.

D. Site Areas

The Cedar View Village Addition is 7.6 acres. Approximately, 4 from the adjacent Woodland Lakes Community Church and approximately 9 acres from Seltzer Elementary School drain into the project site. These adjacent areas were evaluated in this drainage report.

E. Benchmarks

Benchmarks used for site control are included on the plat provided previously under Tab 1, Figure 1.2.

F. Streams, Creeks, and Waterways

No portion of the site is included in a regulatory floodplain as shown on FIRM Panel 387, Sedgwick County, Kansas February 2, 2007 in Figure 2.3.

G. Soils

According to the NRCS (SCS) Sedgwick County Soil Survey, Figure 2.4, virtually the entire site is in the Rosehill and Irwin Series: silty clay, 1 to 3 percent slopes; well-drained soil on upland divides and in even side slopes. Substratum is a calcareous clay. In places the surface layer is calcareous. The Hydrologic Soil Group (HSG) for both soils is “D”.

H. Natural Features

There are no natural bodies of water adjacent to the site.

I. Location of Existing Impervious Areas

The site is currently undeveloped open space except for a small street and a cul-de-sac on the north half of the property. A house is located along the east side of the street.

J. Location of Existing Utilities

Water, sewer, underground electric, and underground telephone have been installed around the existing house and are located along the east side of the property.

K. Location of Existing Conveyance Systems

The dry detention pond discharges through a 42" storm sewer into another detention pond in the southwest corner of the property owned by Woodland Lakes Community Church. The storm sewer runs along the north side of Lincoln Road toward Greenwich Road.

L. Flow Paths

Flow paths are shown on the Existing Conditions Drawing, Figure 2.2.

M. Location and Sizes of Existing Structures

There are no existing channels, bridges, or culverts on the site.

N. Existing Conditions Hydrologic Analysis

The site was divided into drainage areas as shown on the pre-project drainage boundary drawing, Figure 2.4. These drainage areas include the offsite areas from Woodland Lakes Community Church and Seltzer Elementary School. All of these basins drain into the dry detention pond in the southeast corner of the site.

For the 100-year storm under existing conditions, the maximum discharge was determined to be 77 cfs and the water elevation was determined to be 1345.4'. The resulting pre-project flows are reported in the table below. Runoff calculations are in Figure 2.5.

Pre-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-project Pond Discharge	27	40	49	60	77

O. Pre-Developed Runoff Curve Numbers

The curve number used for pre-developed conditions is 81 for onsite and offsite watersheds.

P. Existing Time of Concentration

The times of concentration for pre-development conditions are shown in the following table. Time of concentration calculations are in Figure 2.6.

Existing Times of Concentration

Area	T_c	Curve Number
	minutes	
WS1	30	81
WS2	28	82
WS3	20	82
Offsite - Northeast	28	81
Offsite - Southeast	27	88

Q. Downstream Drainage Capacity

The detention pond west of the site that receives storm water from the dry pond on site is designed to function for the 2-, 5-, and 10-year storms. All larger storms flow over a supplemental spillway in a ditch along Greenwich Road.

R. Existing Structural Elevations

The outlet for the dry detention pond is a modified City of Wichita drop inlet with an elevation of 1344 feet. The storm sewer manhole from the dry detention pond has an invert elevation of 1335 feet.

S. Open Channels

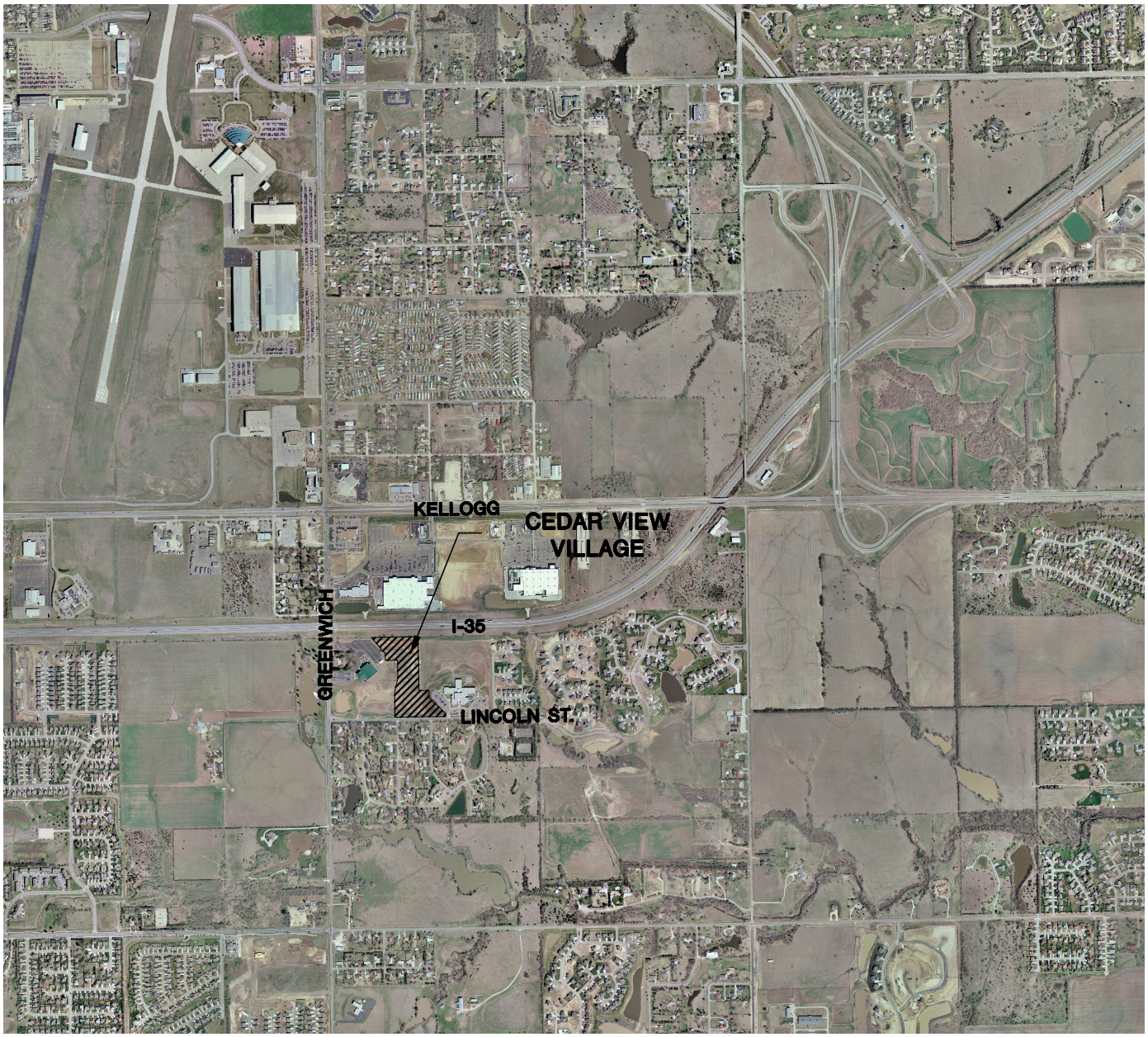
There are no open channels on the site.

T. Groundwater Elevations

Groundwater elevations are not applicable for Cedar View Village.

Figure 2.1

Orthophotograph



N

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

J:\Civil\06189\dwg\drng\06189AERIAL.DWG

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

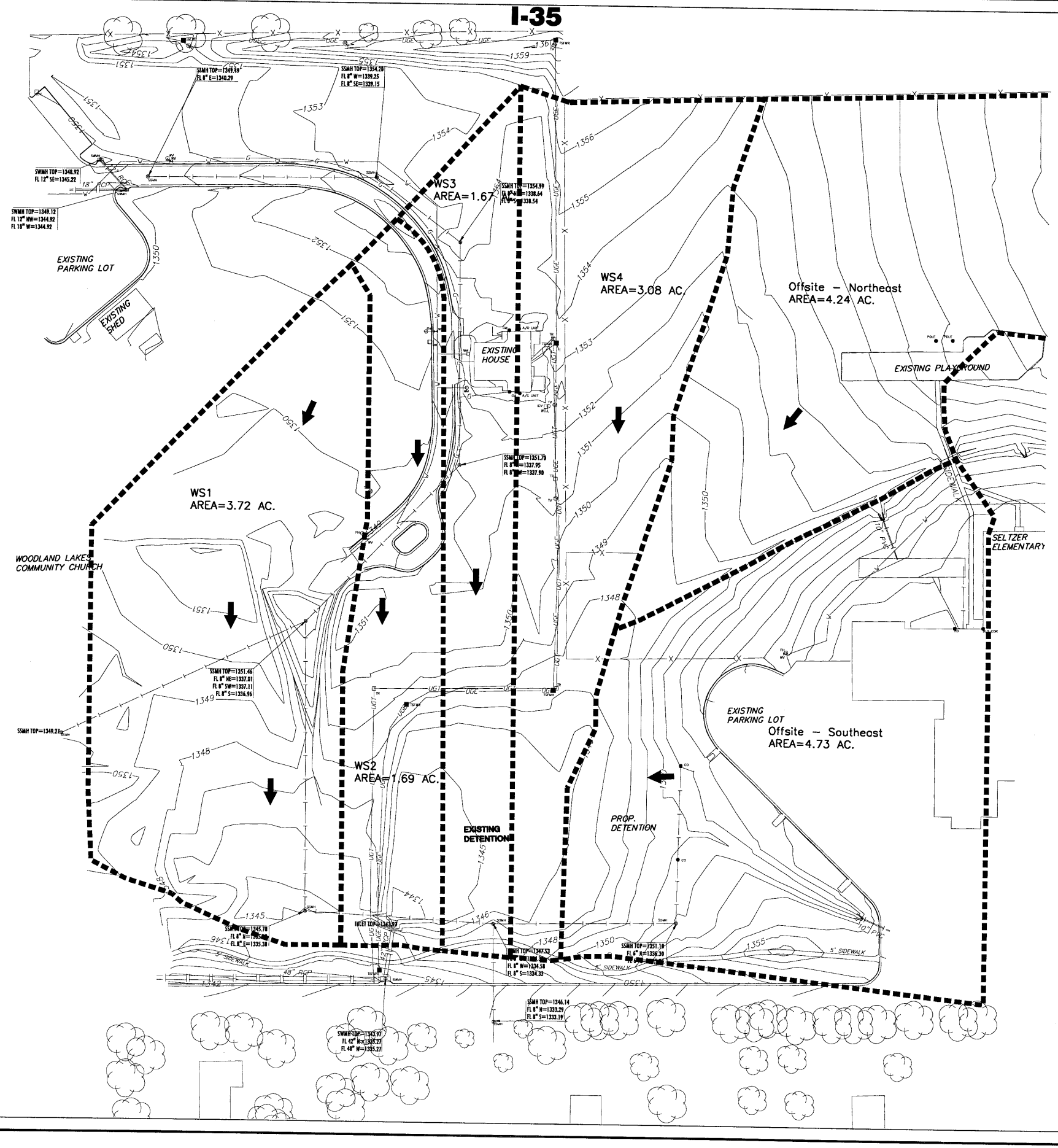
CEDAR VIEW VILLAGE
PROJECT NAME

AERIAL MAP
SHEET TITLE

AJF	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
OCTOBER 2007	06189	1 / 1
DATE	JOB NO.	SHEET/OF

Figure 2.2

Existing Conditions Drawing



LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE !
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING
- LINES REMOVED

N

SCALE: 1"=60'

0 60 120

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

PRELIMINARY NOT FOR CONSTRUCTION

EXISTING CONDITIONS

CEDAR VIEW VILLAGE

EXISTING CONDITIONS
SHEET TITLE

06189
PROJECT NUMBER

AF , CMJ , KLA
DESIGNED DRAWN CHECKED

ISSUED
OCTOBER 2007

REVISED

SHEET NO.
1 OF 1

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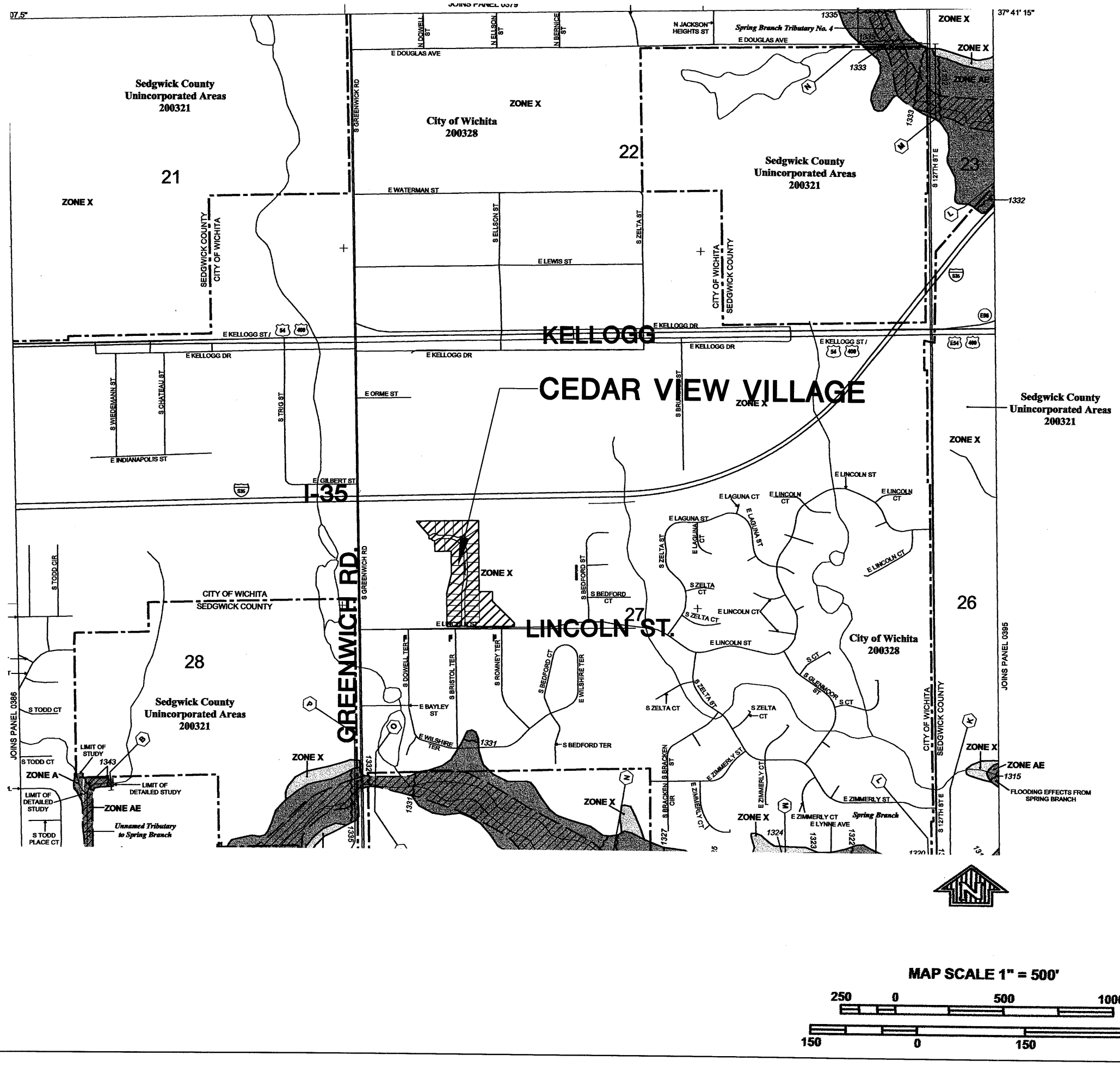
PLOTTED: Tuesday, October 09, 2007 @ 01:28PM

Figure 2.3

FIRM



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0387E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 387 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0387	E
WICHITA, CITY OF	200328	0387	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
20173C0387E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

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MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

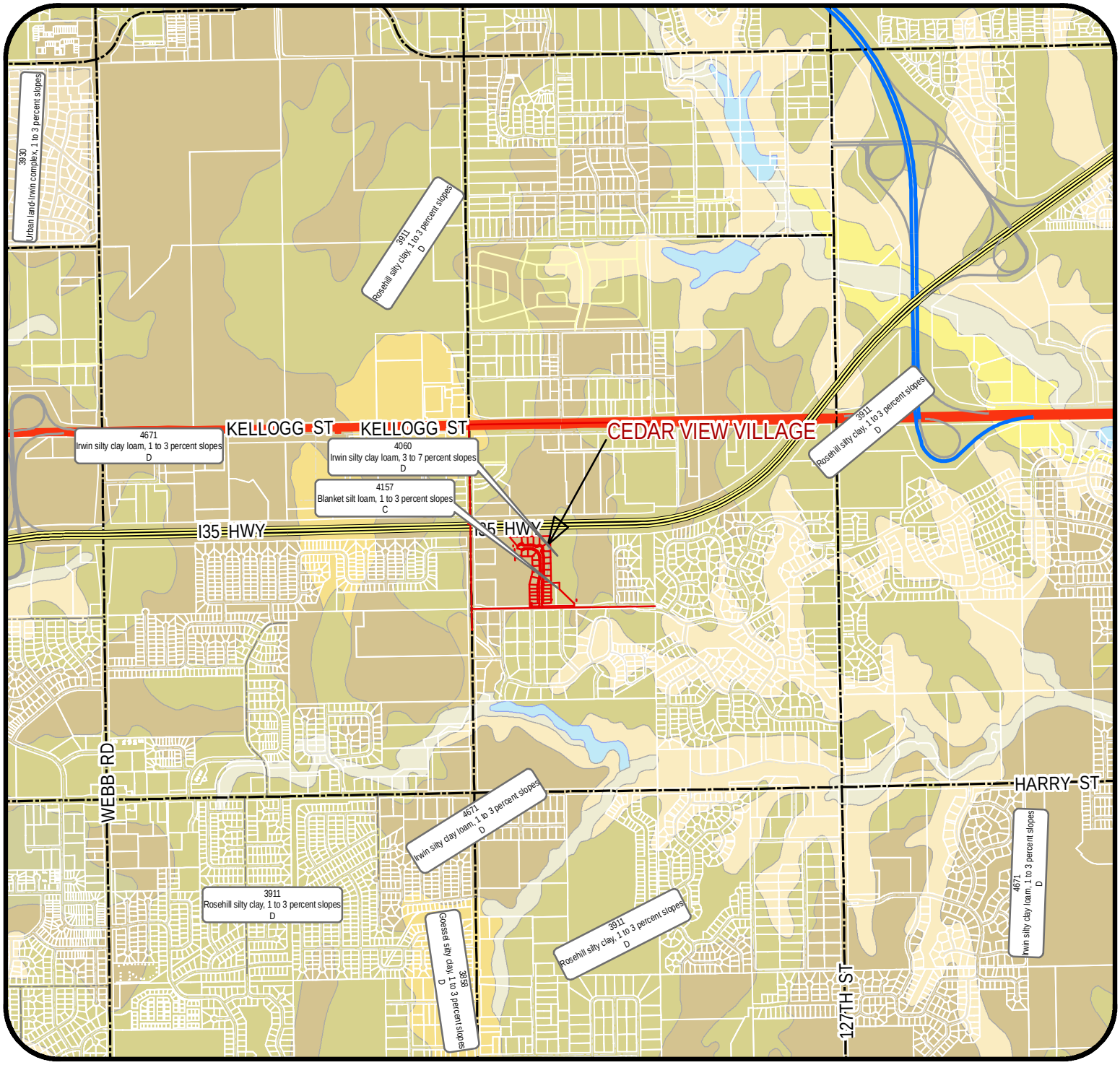
CEDAR VIEW VILLAGE
PROJECT NAME

FIRM PANEL 387 OF 700
SHEET TITLE

AJF	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
OCTOBER 2007	*06189*	*1 / 1*
DATE	JOB NO.	SHEET/OF

Figure 2.4

Soil Survey



1 0.5 0 1 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

J:\Civil\06189\dwg\DRNG\nrcs-soil.mxd

CEDAR VEIW VILLAGE

Project Name:

Soil Survey - Sedgwick County, KS

Sheet Title:

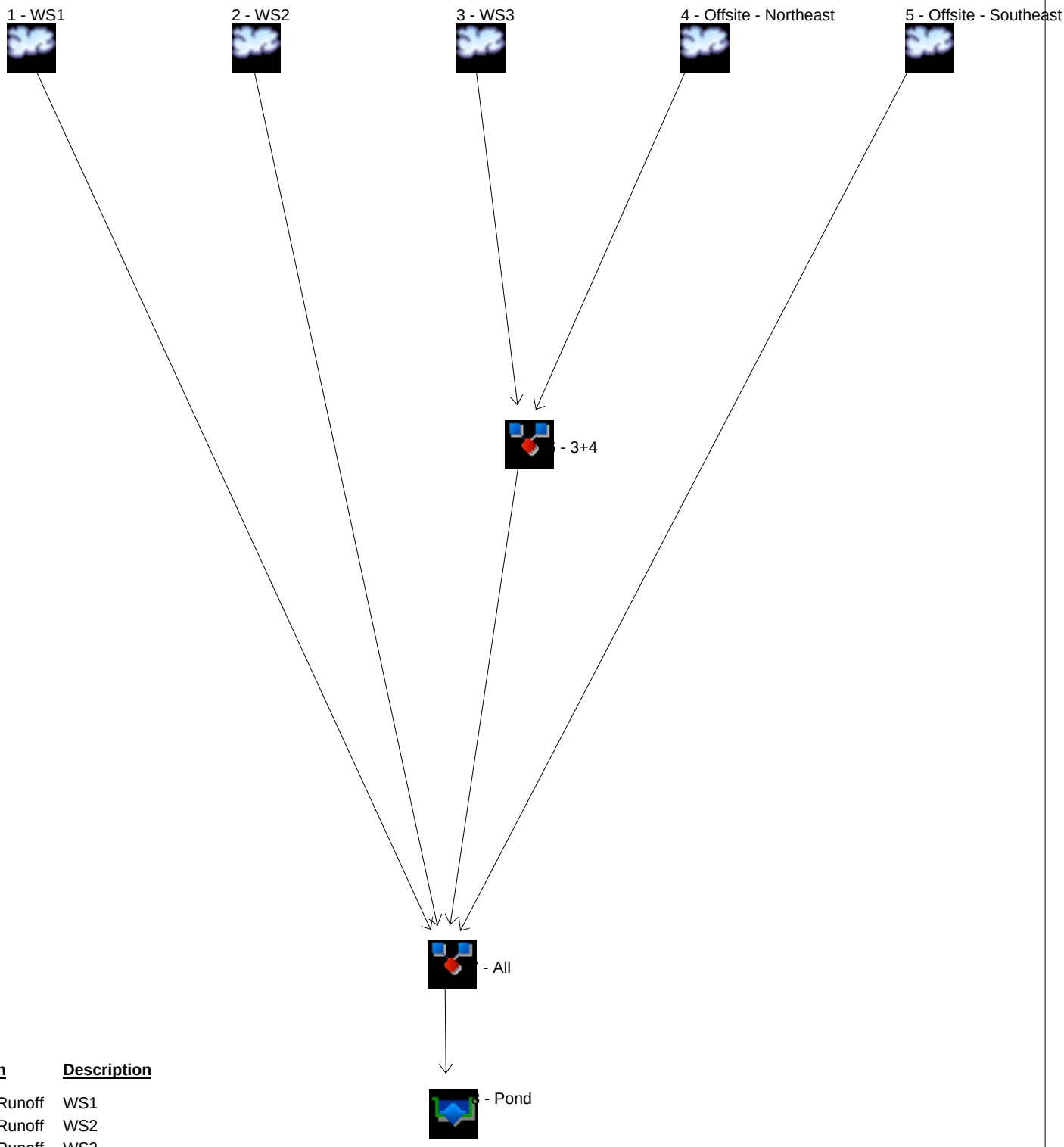
MKEC ENGINEERING CONSULTANTS, INC.

CMJ	OCT. 2007
Drawn By:	Date:
AF/KLA	06189
Design / Review:	Job No.:

Figure 2.5

Hydraflow Hydrographs

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	WS1
2	SCS Runoff	WS2
3	SCS Runoff	WS3
4	SCS Runoff	Offsite - Northeast
5	SCS Runoff	Offsite - Southeast
6	Combine	3+4
7	Combine	All
8	Reservoir	Pond

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	5.477	-------	8.432	10.43	13.53	-------	18.01	WS1
2	SCS Runoff	-------	-------	4.196	-------	6.385	7.875	10.16	-------	13.44	WS2
3	SCS Runoff	-------	-------	4.043	-------	6.202	7.655	9.863	-------	13.04	WS3
4	SCS Runoff	-------	-------	5.314	-------	8.182	10.12	13.13	-------	17.48	Offsite - Northeast
5	SCS Runoff	-------	-------	7.930	-------	11.38	13.66	17.06	-------	21.90	Offsite - Southeast
6	Combine	3, 4,	-------	9.265	-------	14.25	17.61	22.72	-------	30.09	3+4
7	Combine	1, 2, 5, 6	-------	26.74	-------	40.41	49.57	63.47	-------	83.44	All
8	Reservoir	7	-------	26.63	-------	40.00	48.91	59.64	-------	76.83	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.477	6	738	27,685	----	------	------	WS1
2	SCS Runoff	4.196	6	738	21,156	----	------	------	WS2
3	SCS Runoff	4.043	6	726	16,604	----	------	------	WS3
4	SCS Runoff	5.314	6	738	26,862	----	------	------	Offsite - Northeast
5	SCS Runoff	7.930	6	732	39,847	----	------	------	Offsite - Southeast
6	Combine	9.265	6	732	43,466	3, 4,	------	------	3+4
7	Combine	26.74	6	732	132,155	1, 2, 5, 6	------	------	All
8	Reservoir	26.63	6	738	132,155	7	1344.67	4,736	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	8.432	6	738	42,392	----	------	------	WS1
2	SCS Runoff	6.385	6	738	32,103	----	------	------	WS2
3	SCS Runoff	6.202	6	726	25,196	----	------	------	WS3
4	SCS Runoff	8.182	6	738	41,130	----	------	------	Offsite - Northeast
5	SCS Runoff	11.38	6	732	57,427	----	------	------	Offsite - Southeast
6	Combine	14.25	6	732	66,327	3, 4,	------	------	3+4
7	Combine	40.41	6	732	198,249	1, 2, 5, 6	------	------	All
8	Reservoir	40.00	6	738	198,248	7	1344.88	6,215	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	10.43	6	732	52,467	----	------	------	WS1
2	SCS Runoff	7.875	6	732	39,574	----	------	------	WS2
3	SCS Runoff	7.655	6	726	31,060	----	------	------	WS3
4	SCS Runoff	10.12	6	732	50,906	----	------	------	Offsite - Northeast
5	SCS Runoff	13.66	6	732	69,177	----	------	------	Offsite - Southeast
6	Combine	17.61	6	732	81,966	3, 4,	------	------	3+4
7	Combine	49.57	6	732	243,184	1, 2, 5, 6	------	------	All
8	Reservoir	48.91	6	738	243,183	7	1345.00	7,108	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	13.53	6	732	68,022	----	------	------	WS1
2	SCS Runoff	10.16	6	732	51,078	----	------	------	WS2
3	SCS Runoff	9.863	6	726	40,089	----	------	------	WS3
4	SCS Runoff	13.13	6	732	65,998	----	------	------	Offsite - Northeast
5	SCS Runoff	17.06	6	732	87,031	----	------	------	Offsite - Southeast
6	Combine	22.72	6	732	106,087	3, 4,	------	------	3+4
7	Combine	63.47	6	732	312,218	1, 2, 5, 6	------	------	All
8	Reservoir	59.64	6	738	312,218	7	1345.13	11,676	Pond

Hydraflow Table of Contents

06189 pre-project.gpw

Hydraflow Hydrographs by Intelisolve v9.23

Tuesday, Oct 9, 2007

100 - Year

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Hydrograph Reports 2

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Hydrograph No. 2, SCS Runoff, WS2 3

Hydrograph No. 3, SCS Runoff, WS3 4

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Hydrograph No. 5, SCS Runoff, Offsite - Southeast 6

Hydrograph No. 6, Combine, 3+4 7

Hydrograph No. 7, Combine, All 8

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Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	18.01	6	732	90,854	----	------	------	WS1
2	SCS Runoff	13.44	6	732	67,922	----	------	------	WS2
3	SCS Runoff	13.04	6	726	53,308	----	------	------	WS3
4	SCS Runoff	17.48	6	732	88,151	----	------	------	Offsite - Northeast
5	SCS Runoff	21.90	6	732	112,839	----	------	------	Offsite - Southeast
6	Combine	30.09	6	732	141,459	3, 4,	------	------	3+4
7	Combine	83.44	6	732	413,074	1, 2, 5, 6	------	------	All
8	Reservoir	76.83	6	738	413,074	7	1345.36	19,416	Pond

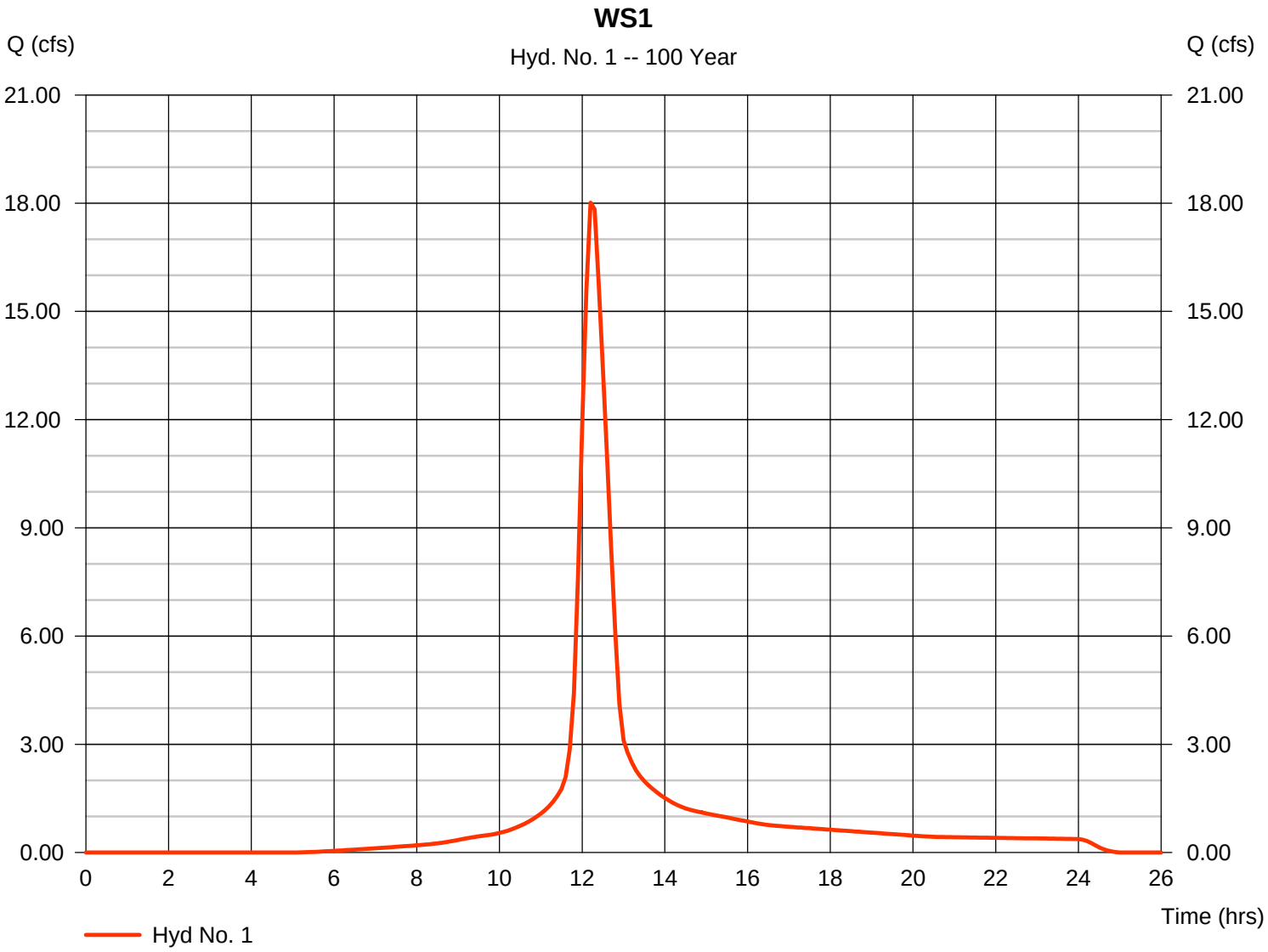
Hydrograph Report

Hyd. No. 1

WS1

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.01 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	90,854 cuft
Drainage area	=	4.370 ac	Curve number	=	81*
Basin Slope	=	1.0 %	Hydraulic length	=	811 ft
Tc method	=	USER	Time of conc. (Tc)	=	30.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (4.250 x 81)] / 4.370



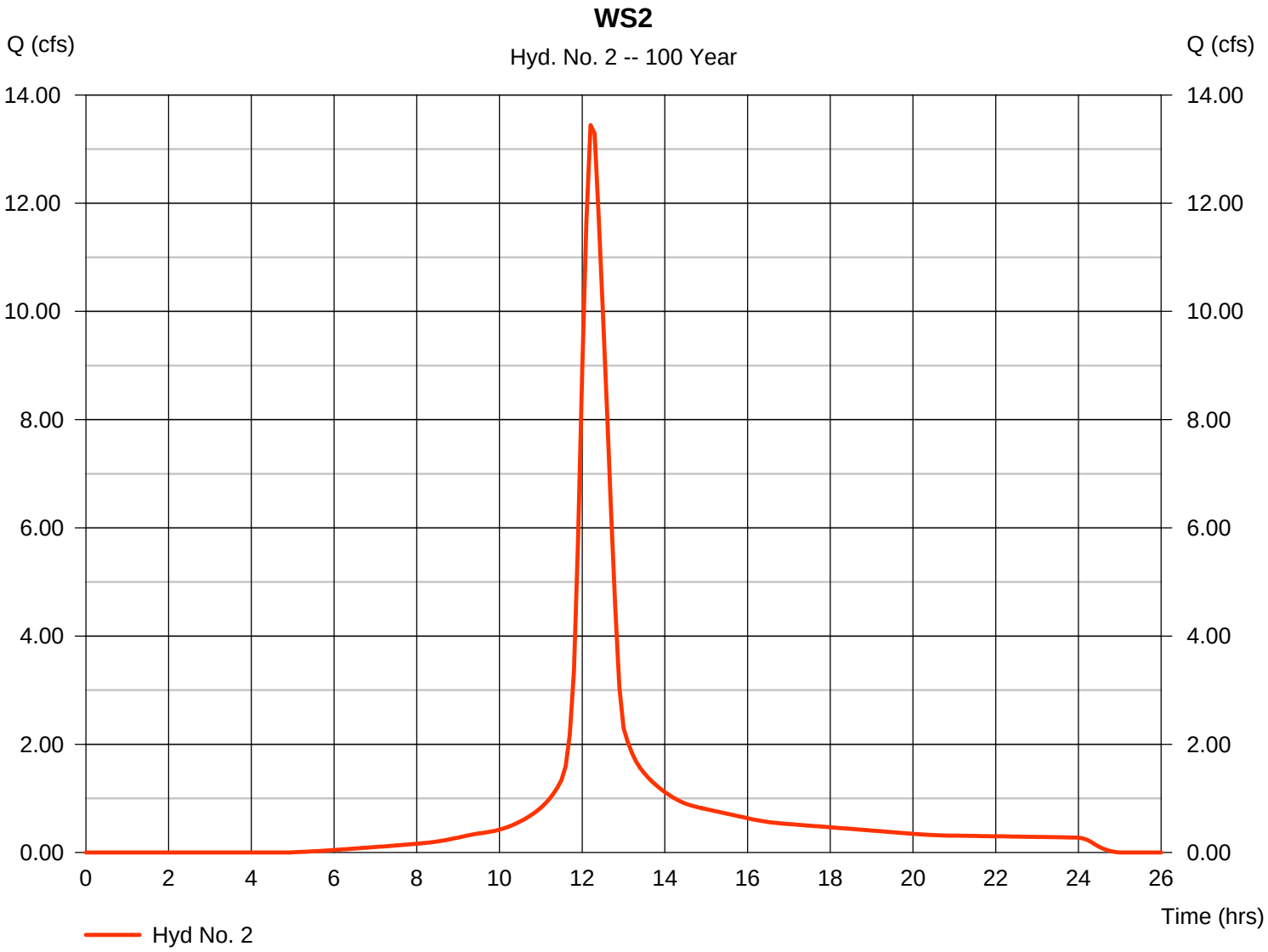
Hydrograph Report

Hyd. No. 2

WS2

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.44 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	67,922 cuft
Drainage area	=	3.200 ac	Curve number	=	82*
Basin Slope	=	1.1 %	Hydraulic length	=	1050 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.210 x 98) + (2.990 x 81)] / 3.200

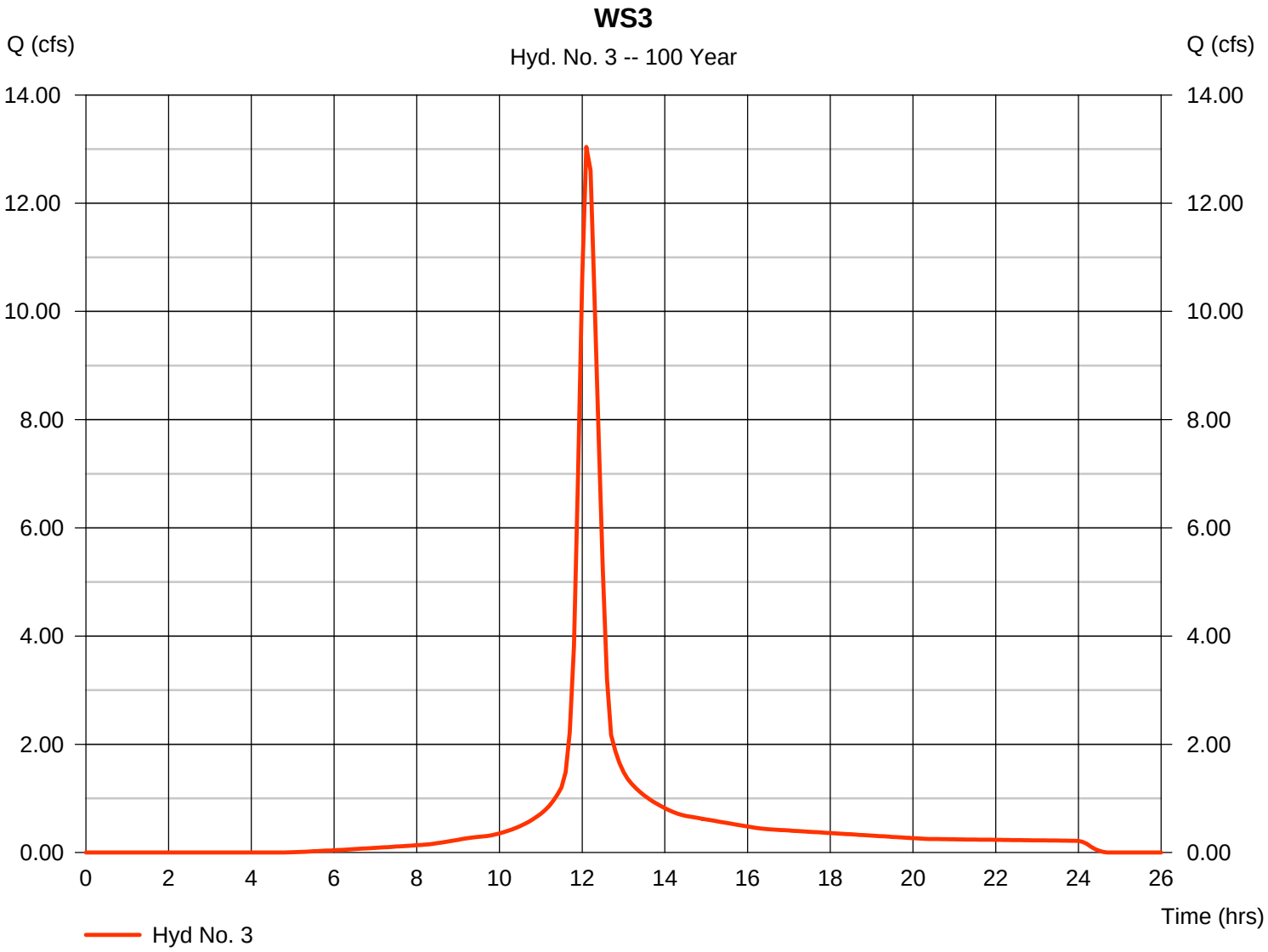


Hydrograph Report

Hyd. No. 3

WS3

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.04 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	6 min	Hyd. volume	=	53,308 cuft
Drainage area	=	2.590 ac	Curve number	=	82
Basin Slope	=	1.6 %	Hydraulic length	=	704 ft
Tc method	=	USER	Time of conc. (Tc)	=	27.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

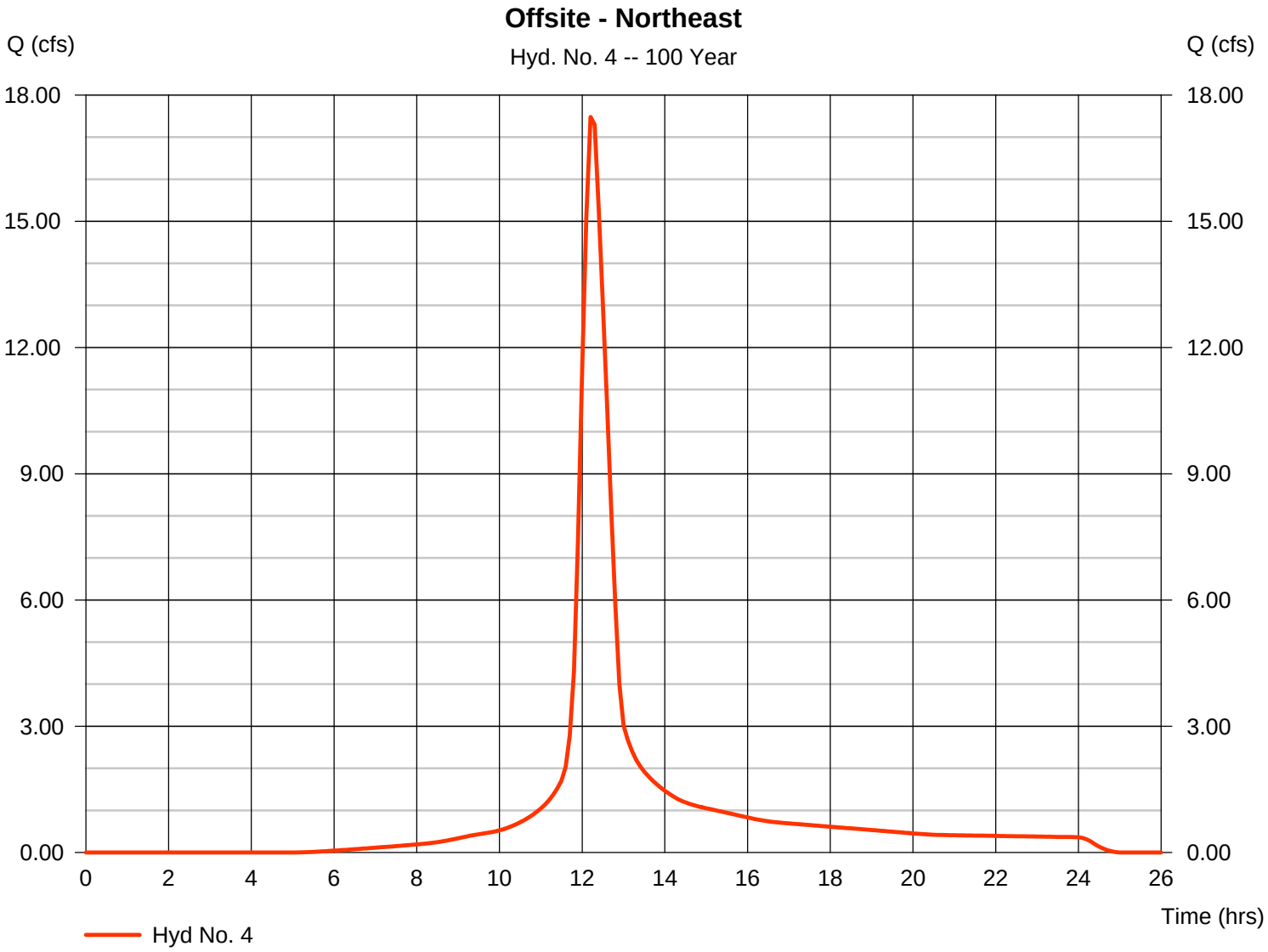


Hydrograph Report

Hyd. No. 4

Offsite - Northeast

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.48 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	88,151 cuft
Drainage area	=	4.240 ac	Curve number	=	81
Basin Slope	=	1.6 %	Hydraulic length	=	887 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



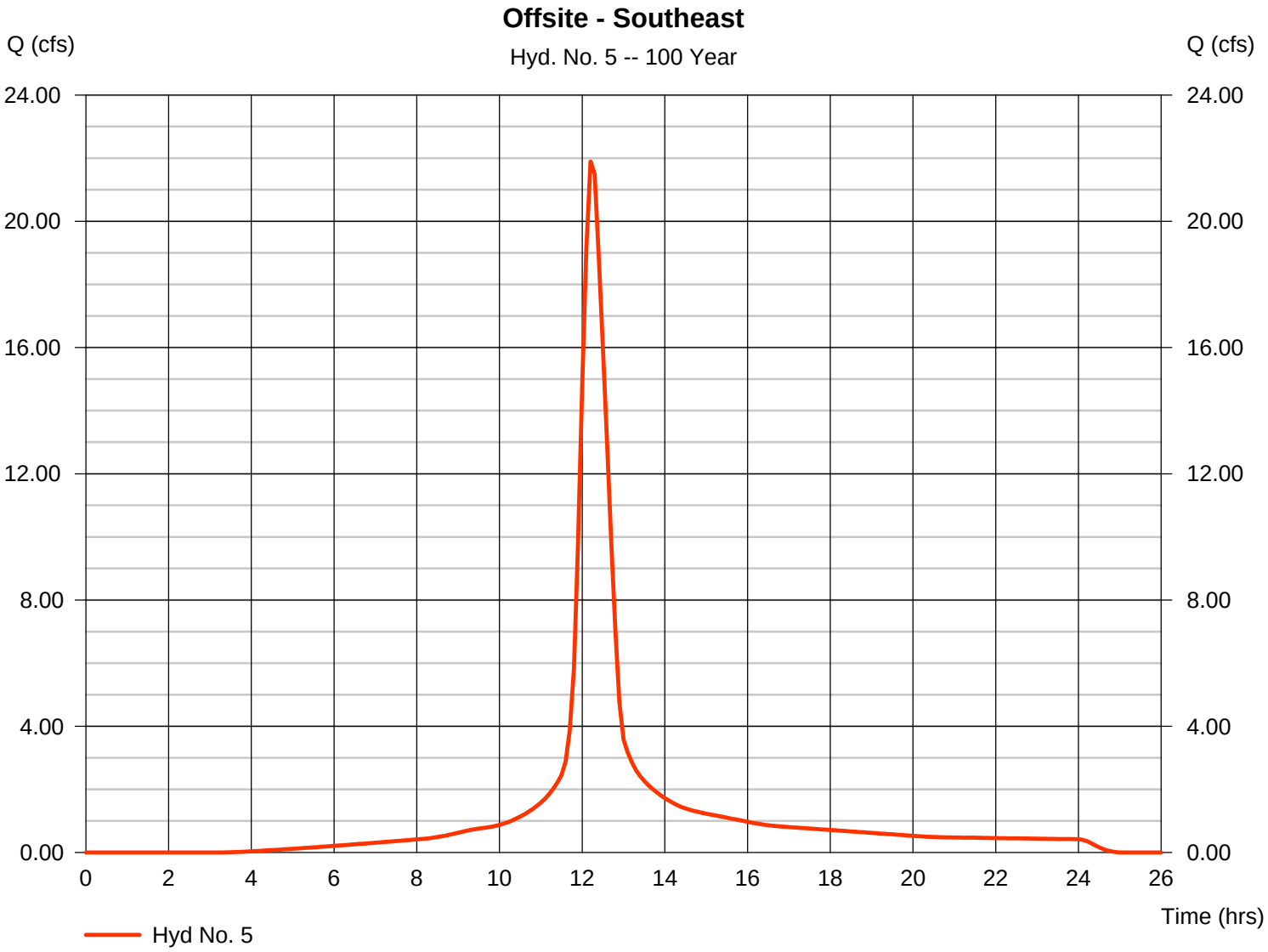
Hydrograph Report

Hyd. No. 5

Offsite - Southeast

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	112,839 cuft
Drainage area	=	4.730 ac	Curve number	=	88*
Basin Slope	=	0.9 %	Hydraulic length	=	1224 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.950 x 81) + (1.780 x 98)] / 4.730

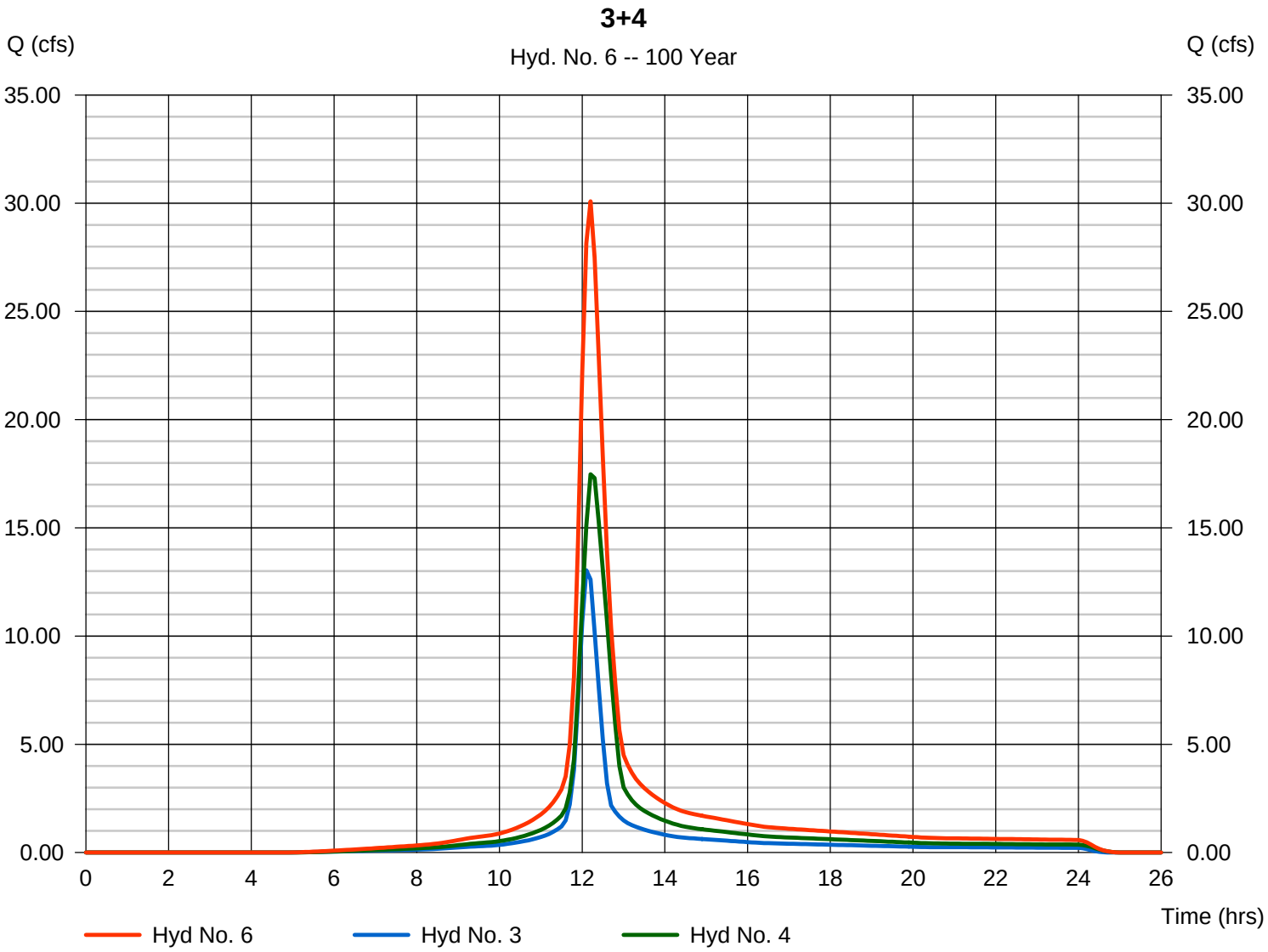


Hydrograph Report

Hyd. No. 6

3+4

Hydrograph type	=	Combine	Peak discharge	=	30.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	141,459 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	6.830 ac

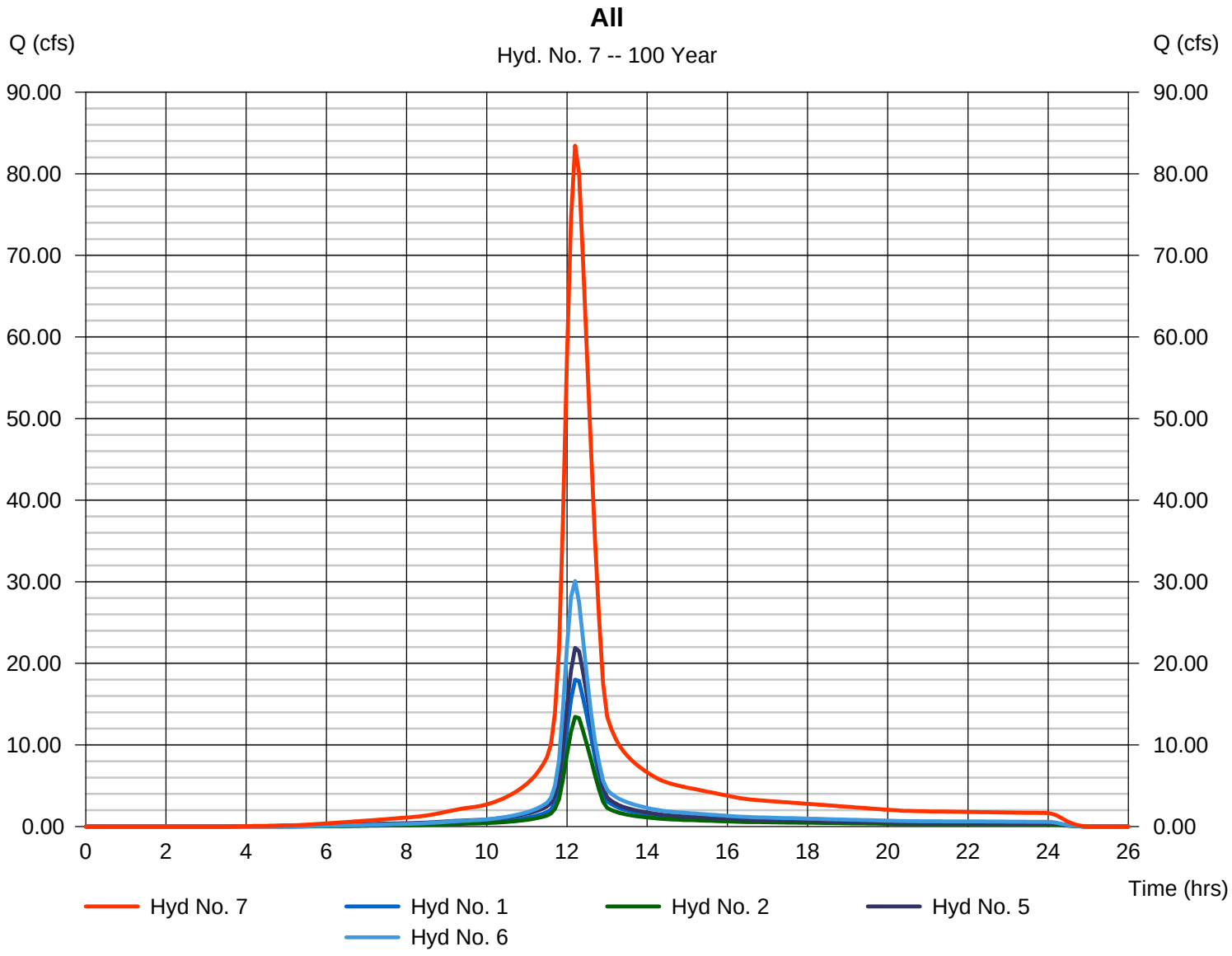


Hydrograph Report

Hyd. No. 7

All

Hydrograph type	=	Combine	Peak discharge	=	83.44 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	413,074 cuft
Inflow hyds.	=	1, 2, 5, 6	Contrib. drain. area	=	12.300 ac



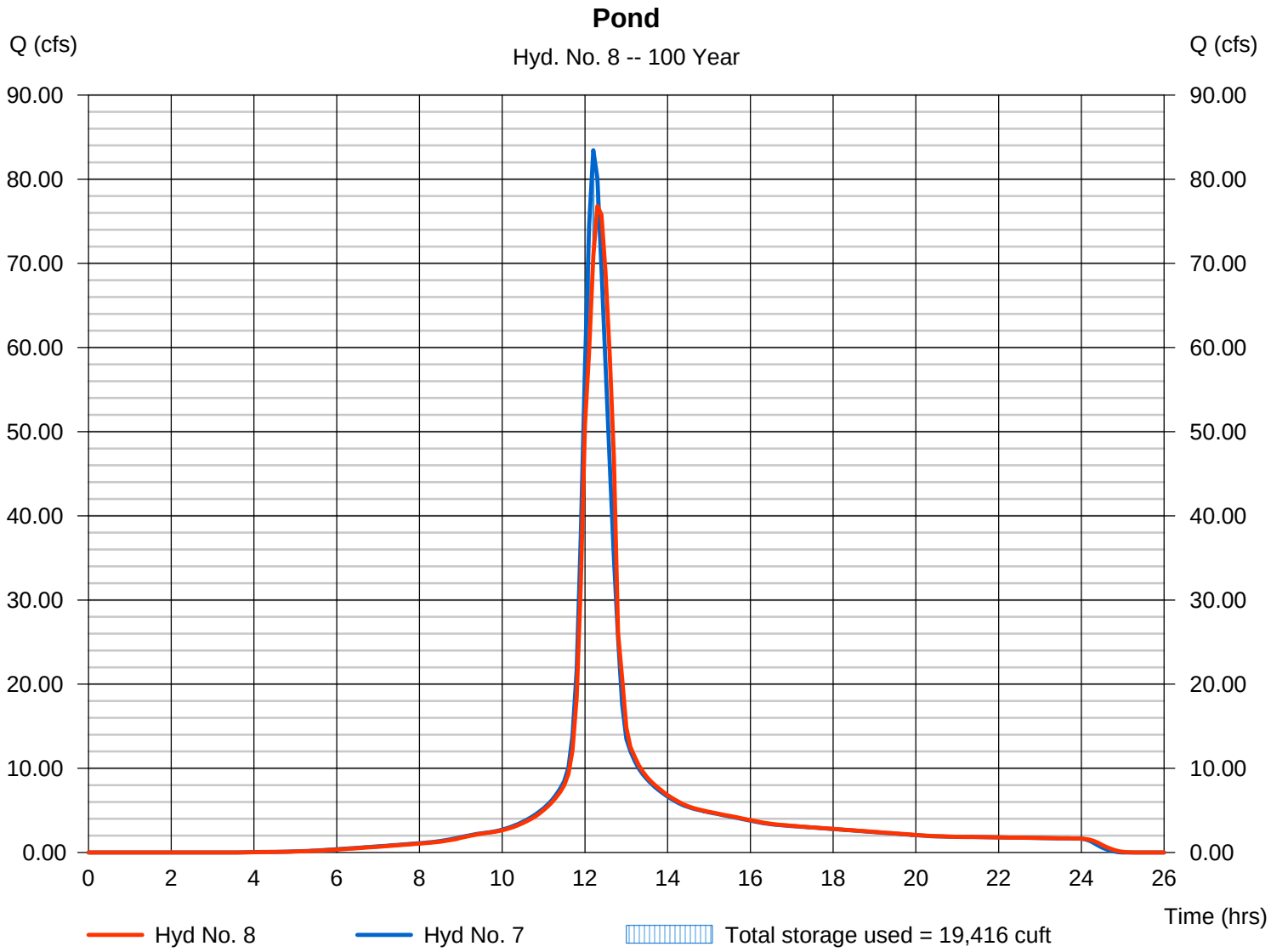
Hydrograph Report

Hyd. No. 8

Pond

Hydrograph type	=	Reservoir	Peak discharge	=	76.83 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	6 min	Hyd. volume	=	413,074 cuft
Inflow hyd. No.	=	7 - All	Max. Elevation	=	1345.36 ft
Reservoir name	=	Dry Pond	Max. Storage	=	19,416 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Dry Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1344.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1344.00	958	0	0
1.00	1345.00	16,679	7,211	7,211
2.00	1346.00	59,001	35,680	42,890
3.00	1347.00	84,747	71,479	114,370

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 42.00	Inactive	0.00	0.00
Span (in)	= 42.00	24.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1339.00	1345.00	0.00	0.00
Length (ft)	= 60.00	60.00	0.00	0.00
Slope (%)	= 0.50	2.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

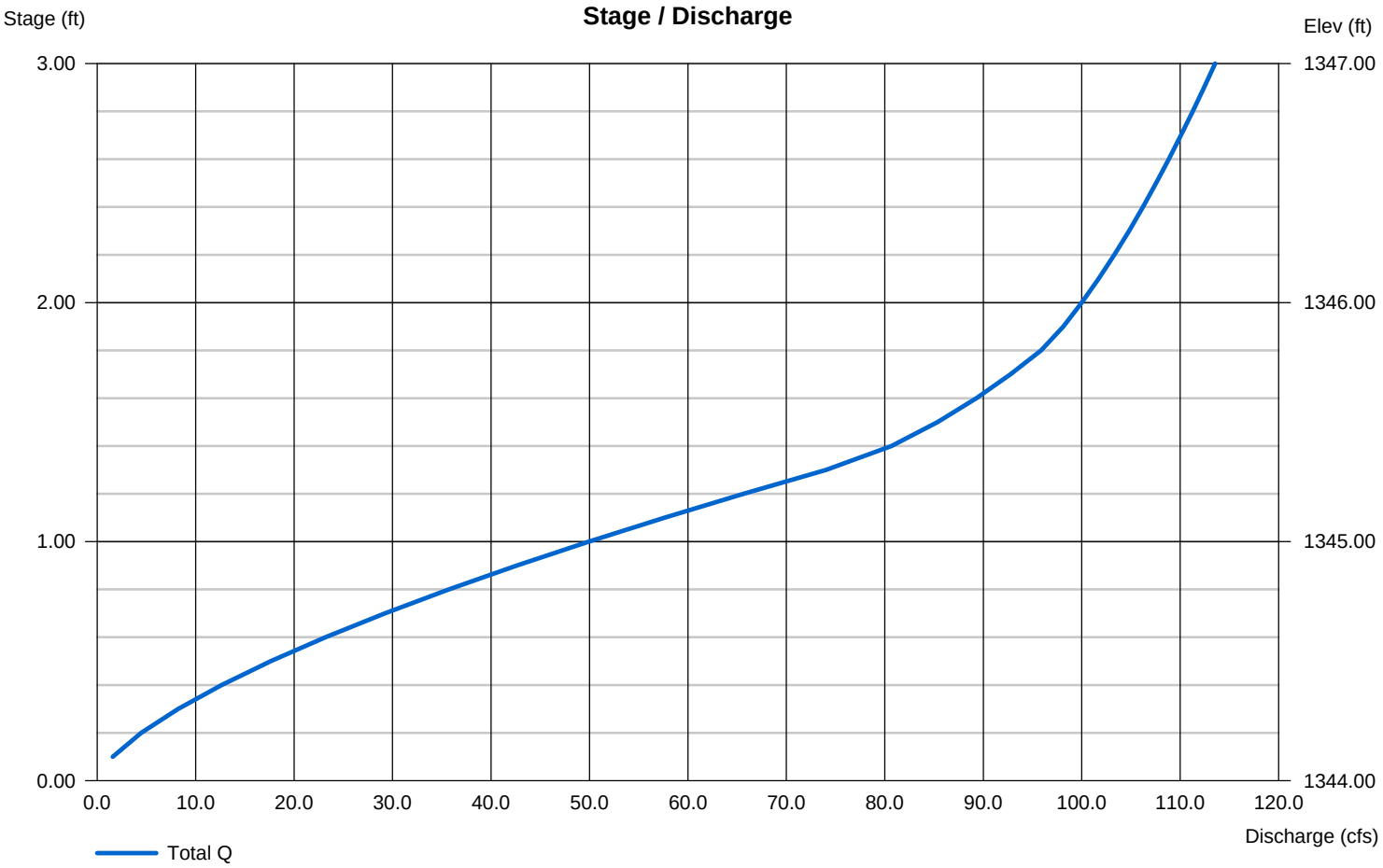
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	0.00	0.00	0.00
Crest El. (ft)	= 1344.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	76.3137	14.3000	0.8844	--------
3	0.0000	0.0000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: SedgwickCoKS.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: SedgwickCoKS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.48	0.00	4.55	5.25	6.30	7.10	7.80
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	2.50	0.00	0.00	0.00	4.60	5.20	5.90

Figure 2.6

Time of Concentration Calculations

Time of Concentration Calculations by the FAA method

Cedar View Village

Project Number 6189

$$T_c = \frac{(1.1-C)L^{1/2}}{100\ S^{1/3}}$$

Area Name	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Flow Length (L)	Rational Runoff Coefficient, C				Time of Concentration (min), T_c				Time of Concentration (hr), T_c				CN
						2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	
Pre-Project																		
WS1	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*700*	0.24	0.29	0.39	0.59	36.4	34.3	30.0	21.6	0.6061	0.5709	0.5004	0.3594	81.0
WS2	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.5*	*0.0*	*980*	0.24	0.29	0.39	0.59	47.4	44.6	39.1	28.1	0.7893	0.7434	0.6516	0.4681	82.0
WS3	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*625*	0.24	0.29	0.39	0.59	33.1	31.2	27.3	19.6	0.5515	0.5194	0.4553	0.3270	82.0
Offsite NE	*Agricultural - Cultivated - Slopes <1%*	*D*	*12.0*	*0.0*	*1030*	0.24	0.29	0.39	0.59	47.2	44.5	39.0	28.0	0.7869	0.7412	0.6497	0.4667	81.0
Offsite SE	*Agricultural - Pasture - Slopes 1-4%*	*D*	*11.0*	*0.0*	*1150*	0.32	0.37	0.47	0.67	48.3	45.2	39.0	26.6	0.8054	0.7538	0.6505	0.4440	88.0
Post-Project																		
WS1	*Drive, Parking Lots & Walks*	*D*	*8.0*	*0.0*	*930*	0.87	0.87	0.88	0.89	15.0	15.0	15.0	15.0	0.2500	0.2500	0.2500	0.2500	98.0
WS2	*Residential - Multi-Family - Multi-Unit (attached)*	*D*	*5.0*	*0.0*	*880*	0.64	0.68	0.73	0.83	29.7	27.1	23.9	17.4	0.4943	0.4513	0.3976	0.2901	92.0
WS3	*Residential - Multi-Family - Multi-Unit (attached)*	*D*	*8.0*	*0.0*	*1010*	0.64	0.68	0.73	0.83	28.4	26.0	22.9	16.7	0.4740	0.4328	0.3813	0.2782	92.0
WS4	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*970*	0.24	0.29	0.39	0.59	47.7	45.0	39.4	28.3	0.7954	0.7492	0.6567	0.4717	81.0
Offsite NE	*Agricultural - Cultivated - Slopes <1%*	*D*	*14.0*	*0.0*	*890*	0.24	0.29	0.39	0.59	39.7	37.4	32.8	23.5	0.6618	0.6233	0.5464	0.3925	81.0
Offsite SE	*Agricultural - Pasture - Slopes 1-4%*	*D*	*11.0*	*0.0*	*1150*	0.32	0.37	0.47	0.67	48.3	45.2	39.0	26.6	0.8054	0.7538	0.6505	0.4440	88.0

Tab 3. Post-Development Hydrologic Analysis

A. Proposed Conditions Hydrologic and Hydraulic Analysis

The post-project drainage boundaries are shown in Figure 3.1. Hydraflow Hydrographs, 2007 by Intelisolve was used to complete the hydrologic analysis for Cedar View Village. The runoff calculations are in Figure 3.2 and the resulting flows are in the table below.

Post-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Post-project Pond Discharge	25	40	48	60	76

For the 100-year storm, under developed conditions, the discharge from the dry detention basin was determined to be 76 cfs with a water surface elevation of 1347.6.

B. Proposed Time of Concentration

The following table shows the post-development time of concentrations. Time of concentration calculations are in Figure 3.3.

Proposed Time of Concentrations

Area	T_c	Curve Number
	minutes	
WS1	15	98
WS2	24	92
WS3	23	92
WS4	39	81
Offsite - Northeast	33	81
Offsite - Southeast	39	88

C. Assumed Post-Developed Curve Numbers

A weighted curve number was used for each watershed. Curve number calculations are in Figure 3.3.

D. Proposed Contours for Detention

The pond as shown on the drainage and utility plan, Figure 3.1, is designed to provide 1.5 ac-ft. of dry detention. The dry detention basin will be designed as a dry, grassy field that will slope to the southwest and drain into an area inlet.

E. Preliminary SWS Sizing Calculations

The proposed dry detention pond will drain into an area inlet with a perimeter of 12 feet at an elevation of 1346.0 feet and discharge through a 36" storm sewer with a flow line of 1340.0 and a 5"x3" wide rectangular slot on the inlet with a flow line of 1344.5.

F. Stage-Storage-Discharge

The stage-storage-discharge for the dry detention pond is in Figure 3.2.

G. Analysis of upstream/downstream impact

Runoff flows for all design storms remain the same or decrease from pre to post-development; therefore, upstream/downstream impacts are unchanged from current conditions.

H. Existing and Proposed Structural Elevations

The existing house on-site has an elevation of 1353.3 feet. Where applicable, minimum pad elevations will be set 3 feet above the 100-year water surface elevation. When feasible, current grade will dictate structural elevations.

I. Pond Design Elevations

The dry detention basin is designed to provide 1.5 ac-ft. of detention and will have a 100-year water surface elevation of 1347.6'.

J. Structure Details

Cedar View Village will consist of single family homes.

K. Limits of Clearing and Grading

The entire site will be cleared and graded.

L. Location of Impervious Areas

Roads will be located as shown on the drainage and utility plan, Figure 3.1.

M. Location of Utilities

Proposed utilities are shown on the drainage and utility plan, Figure 3.1.

N. Location of Conveyance Systems

Stormsewer will carry flow from the paving and backyards into the dry detention basin or channel. Proposed stormsewer lines are shown on the drainage and utility plan, Figure 3.1.

O. Location of Channel Modifications

There are no proposed channels on the site.

P. Selection and Location of Stormwater Controls

Stormwater controls consist of curb and area inlets, located throughout the Addition, storm sewer sized to handle the 2-year flows in the residential areas.

Q. Emergency Overflow

The drainage swale will emergency overflow to the west of the pond.

R. Freeboard

The drainage swale design will include a 1-foot freeboard for added safety.

S. 100-Year High Water Line

Hydraflow Hydragraphs 2007, by Intellisolve was used to determine that the 100-year water surface elevation for the dry detention basin is 1347.6'. This will keep the water out of the playground area for the adjacent Seltzer Elementary School in the 100-year event.

T. Lowest Openings

The lowest openings for lots adjacent to the detention pond will be set at 1350.6. All other lots will be graded to maintain at least 0.5% slope in the streets and 2% in the backyards.

U. Stormwater Management Facilities

The detention corridor onsite is located within a reserve.

V. Maintenance Responsibility

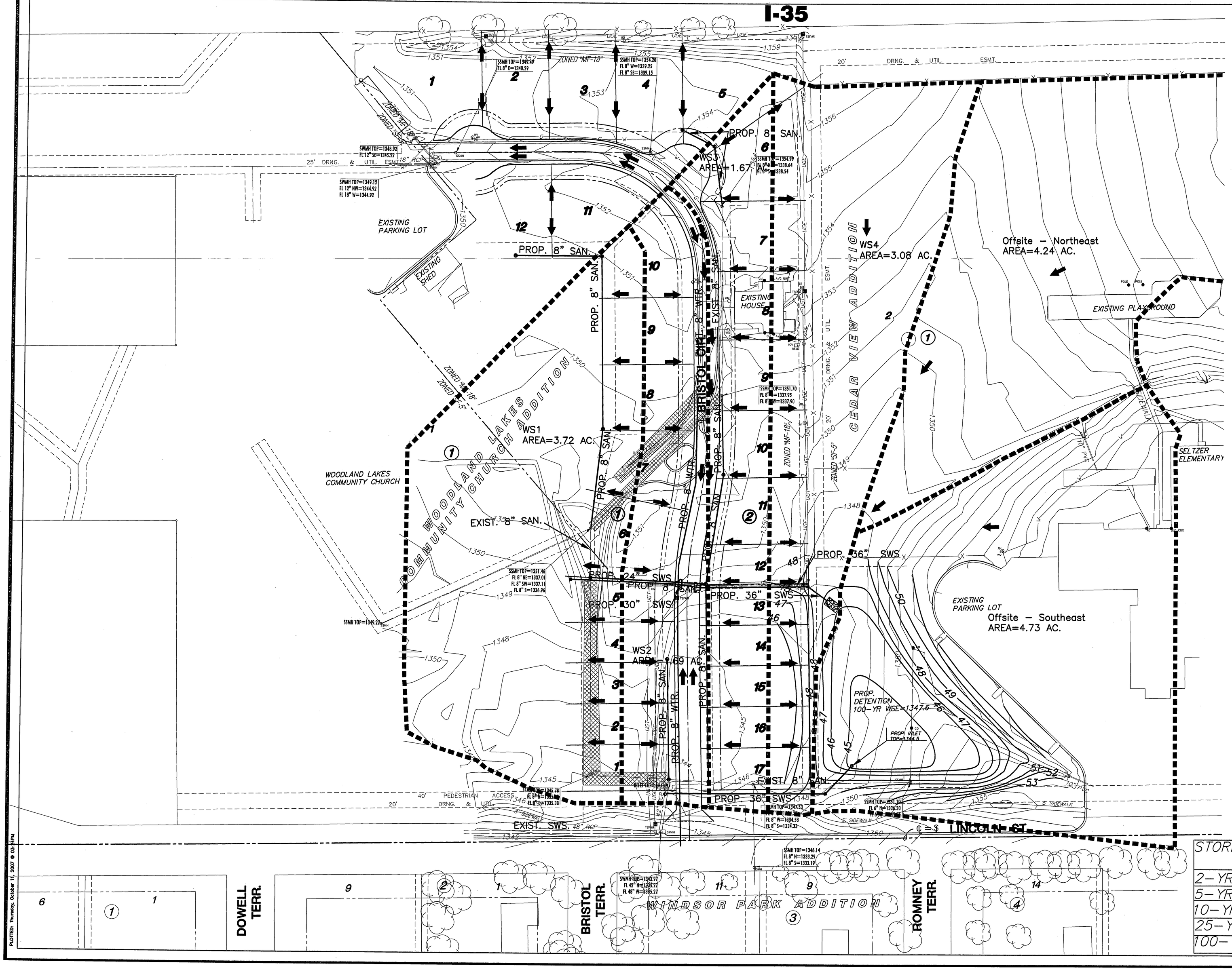
The maintenance of the reserve will be the responsibility of the owner until it is turned over to the homeowners association.

W. Offsite-Drainage Easements

Not applicable to Cedar View Village.

Figure 3.1

Drainage and Utility Plan



LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE !
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING
- LINES REMOVED

PROP. DETENTION

STORM	Q(CFS)	WSEL	VOLUME AC-FT
2-YR	25	1346.7	0.8
5-YR	40	1347.0	1.0
10-YR	48	1347.1	1.1
25-YR	60	1347.3	1.3
100-YR	76	1347.6	1.5

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

PRELIMINARY NOT FOR CONSTRUCTION

DRAINAGE AND UTILITY PLAN
CEDAR VIEW VILLAGE

DRAINAGE AND UTILITY
SHEET TITLE

06189
PROJECT NUMBER

AF / CMJ / KLA
DESIGNED DRAWN CHECKED

ISSUED
October 2007
REVISED

SHEET NO.
1 OF 1

PLOTTED: Thursday, October 11, 2007 @ 03:54PM
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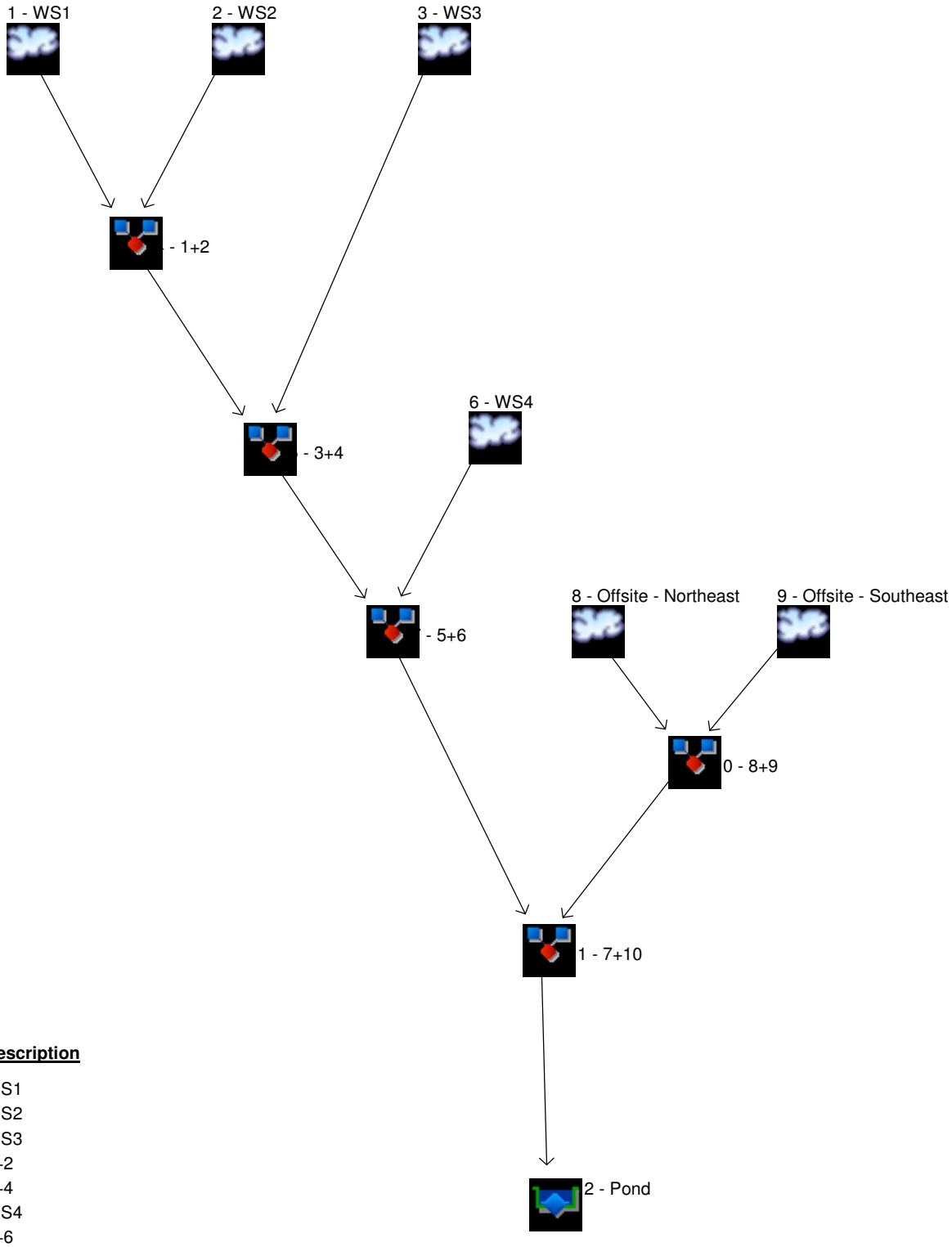
Figure 3.2

Hydraflow Hydrographs

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	WS1
2	SCS Runoff	WS2
3	SCS Runoff	WS3
4	Combine	1+2
5	Combine	3+4
6	SCS Runoff	WS4
7	Combine	5+6
8	SCS Runoff	Offsite - Northeast
9	SCS Runoff	Offsite - Southeast
10	Combine	8+9
11	Combine	7+10
12	Reservoir	Pond

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	12.08	-------	15.87	18.35	22.06	-------	27.35	WS1
2	SCS Runoff	-------	-------	3.911	-------	5.387	6.347	7.779	-------	9.810	WS2
3	SCS Runoff	-------	-------	3.864	-------	5.323	6.272	7.687	-------	9.694	WS3
4	Combine	1, 2,	-------	15.28	-------	20.32	23.60	28.52	-------	35.52	1+2
5	Combine	3, 4	-------	18.45	-------	24.72	28.80	34.92	-------	43.61	3+4
6	SCS Runoff	-------	-------	3.860	-------	5.943	7.354	9.539	-------	12.70	WS4
7	Combine	5, 6	-------	21.62	-------	29.74	35.08	43.11	-------	54.58	5+6
8	SCS Runoff	-------	-------	5.314	-------	8.182	10.12	13.13	-------	17.48	Offsite - Northeast
9	SCS Runoff	-------	-------	7.930	-------	11.38	13.66	17.06	-------	21.90	Offsite - Southeast
10	Combine	8, 9	-------	13.21	-------	19.54	23.78	30.19	-------	39.37	8+9
11	Combine	7, 10	-------	32.80	-------	46.48	55.55	69.23	-------	88.82	7+10
12	Reservoir	11	-------	24.89	-------	39.57	48.01	60.43	-------	75.53	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	12.08	6	720	0.938	----	------	------	WS1
2	SCS Runoff	3.911	6	726	0.369	----	------	------	WS2
3	SCS Runoff	3.864	6	726	0.364	----	------	------	WS3
4	Combine	15.28	6	720	1.307	1, 2,	------	------	1+2
5	Combine	18.45	6	720	1.671	3, 4	------	------	3+4
6	SCS Runoff	3.860	6	738	0.448	----	------	------	WS4
7	Combine	21.62	6	726	2.119	5, 6	------	------	5+6
8	SCS Runoff	5.314	6	738	0.617	----	------	------	Offsite - Northeast
9	SCS Runoff	7.930	6	732	0.915	----	------	------	Offsite - Southeast
10	Combine	13.21	6	738	1.531	8, 9	------	------	8+9
11	Combine	32.80	6	726	3.651	7, 10	------	------	7+10
12	Reservoir	24.89	6	738	3.651	11	1346.68	0.834	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	15.87	6	720	1.247	----	------	------	WS1
2	SCS Runoff	5.387	6	726	0.514	----	------	------	WS2
3	SCS Runoff	5.323	6	726	0.508	----	------	------	WS3
4	Combine	20.32	6	720	1.761	1, 2,	------	------	1+2
5	Combine	24.72	6	726	2.269	3, 4	------	------	3+4
6	SCS Runoff	5.943	6	738	0.686	----	------	------	WS4
7	Combine	29.74	6	726	2.955	5, 6	------	------	5+6
8	SCS Runoff	8.182	6	738	0.944	----	------	------	Offsite - Northeast
9	SCS Runoff	11.38	6	732	1.318	----	------	------	Offsite - Southeast
10	Combine	19.54	6	732	2.263	8, 9	------	------	8+9
11	Combine	46.48	6	726	5.218	7, 10	------	------	7+10
12	Reservoir	39.57	6	738	5.218	11	1346.95	1.01	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	18.35	6	720	1.449	----	------	------	WS1
2	SCS Runoff	6.347	6	726	0.610	----	------	------	WS2
3	SCS Runoff	6.272	6	726	0.603	----	------	------	WS3
4	Combine	23.60	6	720	2.059	1, 2,	------	------	1+2
5	Combine	28.80	6	726	2.662	3, 4	------	------	3+4
6	SCS Runoff	7.354	6	732	0.849	----	------	------	WS4
7	Combine	35.08	6	726	3.511	5, 6	------	------	5+6
8	SCS Runoff	10.12	6	732	1.169	----	------	------	Offsite - Northeast
9	SCS Runoff	13.66	6	732	1.588	----	------	------	Offsite - Southeast
10	Combine	23.78	6	732	2.757	8, 9	------	------	8+9
11	Combine	55.55	6	726	6.268	7, 10	------	------	7+10
12	Reservoir	48.01	6	738	6.268	11	1347.09	1.11	Pond

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	22.06	6	720	1.752	----	------	------	WS1
2	SCS Runoff	7.779	6	726	0.756	----	------	------	WS2
3	SCS Runoff	7.687	6	726	0.747	----	------	------	WS3
4	Combine	28.52	6	720	2.508	1, 2,	------	------	1+2
5	Combine	34.92	6	726	3.254	3, 4	------	------	3+4
6	SCS Runoff	9.539	6	732	1.101	----	------	------	WS4
7	Combine	43.11	6	726	4.355	5, 6	------	------	5+6
8	SCS Runoff	13.13	6	732	1.515	----	------	------	Offsite - Northeast
9	SCS Runoff	17.06	6	732	1.998	----	------	------	Offsite - Southeast
10	Combine	30.19	6	732	3.513	8, 9	------	------	8+9
11	Combine	69.23	6	726	7.868	7, 10	------	------	7+10
12	Reservoir	60.43	6	738	7.868	11	1347.29	1.27	Pond

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06189 post-project.gpw

Hydraflow Hydrographs by Intelisolve v9.23

Thursday, Oct 11, 2007

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Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

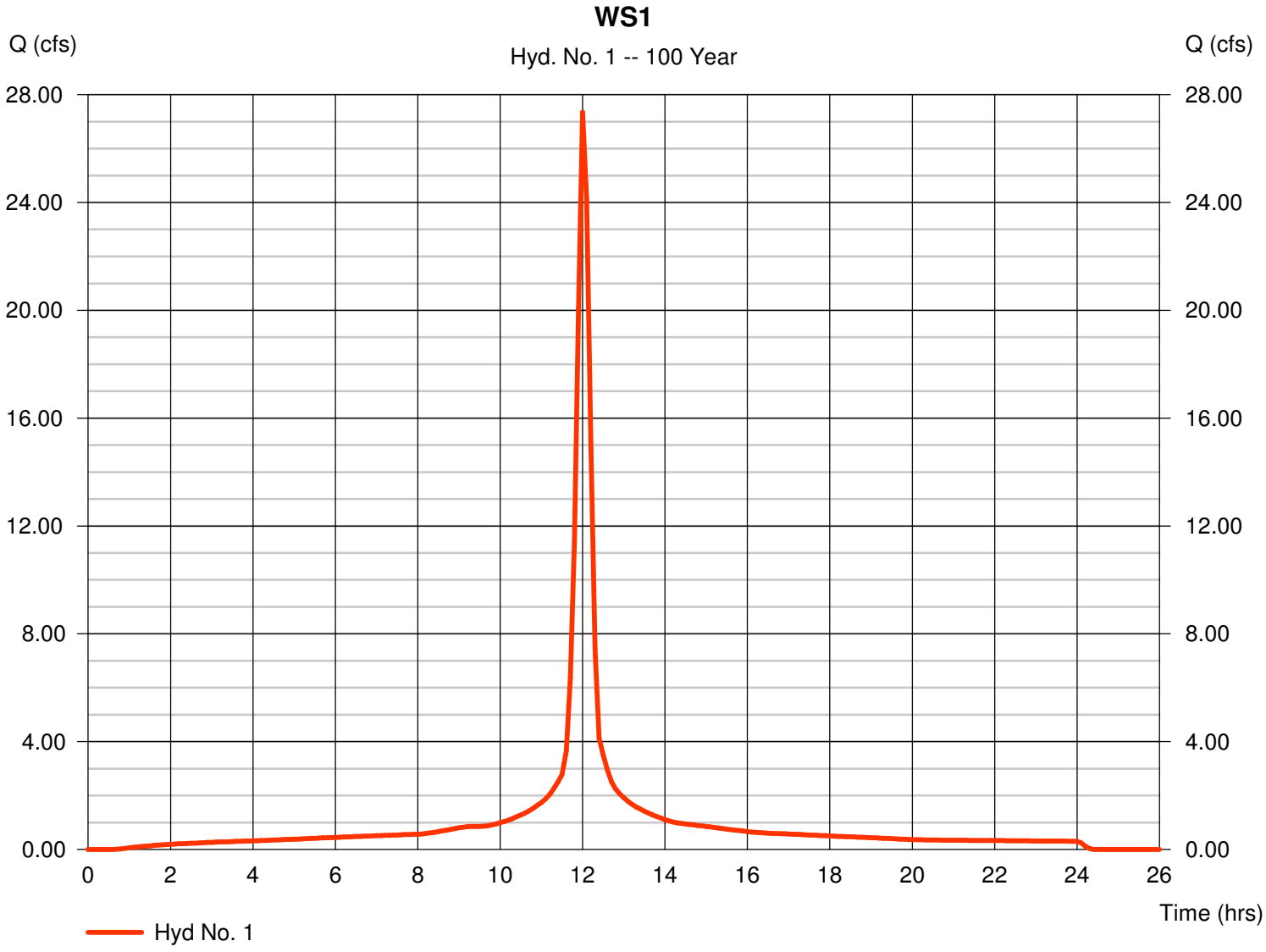
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	27.35	6	720	2.185	----	------	------	WS1
2	SCS Runoff	9.810	6	726	0.964	----	------	------	WS2
3	SCS Runoff	9.694	6	726	0.953	----	------	------	WS3
4	Combine	35.52	6	720	3.149	1, 2,	------	------	1+2
5	Combine	43.61	6	726	4.102	3, 4	------	------	3+4
6	SCS Runoff	12.70	6	732	1.470	----	------	------	WS4
7	Combine	54.58	6	726	5.572	5, 6	------	------	5+6
8	SCS Runoff	17.48	6	732	2.024	----	------	------	Offsite - Northeast
9	SCS Runoff	21.90	6	732	2.590	----	------	------	Offsite - Southeast
10	Combine	39.37	6	732	4.614	8, 9	------	------	8+9
11	Combine	88.82	6	726	10.186	7, 10	------	------	7+10
12	Reservoir	75.53	6	738	10.186	11	1347.57	1.51	Pond

Hydrograph Report

Hyd. No. 1

WS1

Hydrograph type	=	SCS Runoff	Peak discharge	=	27.35 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	6 min	Hyd. volume	=	2.185 acft
Drainage area	=	3.700 ac	Curve number	=	98
Basin Slope	=	0.9 %	Hydraulic length	=	927 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

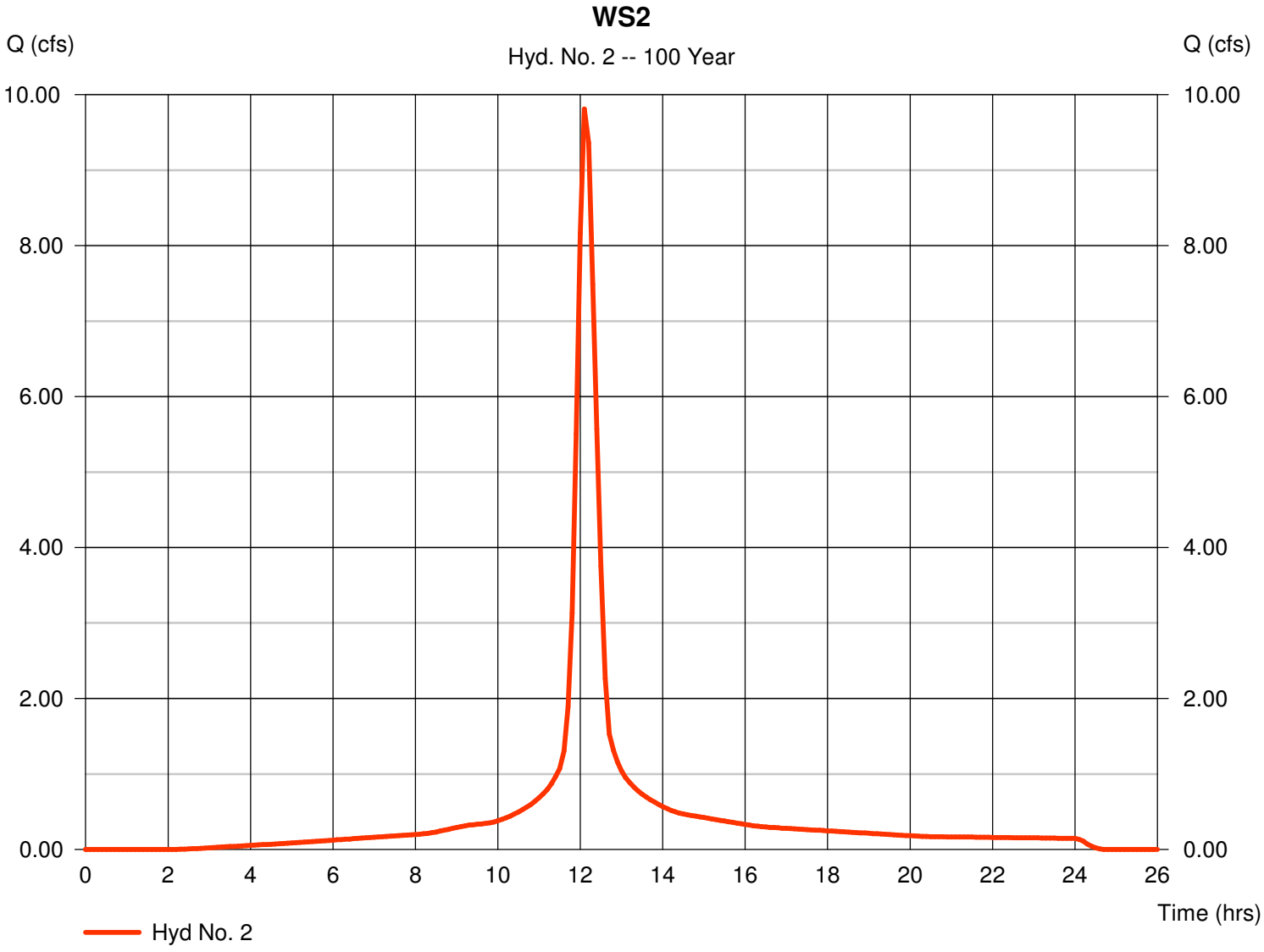


Hydrograph Report

Hyd. No. 2

WS2

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.810 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	6 min	Hyd. volume	=	0.964 acft
Drainage area	=	1.690 ac	Curve number	=	92
Basin Slope	=	0.6 %	Hydraulic length	=	879 ft
Tc method	=	USER	Time of conc. (Tc)	=	23.90 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

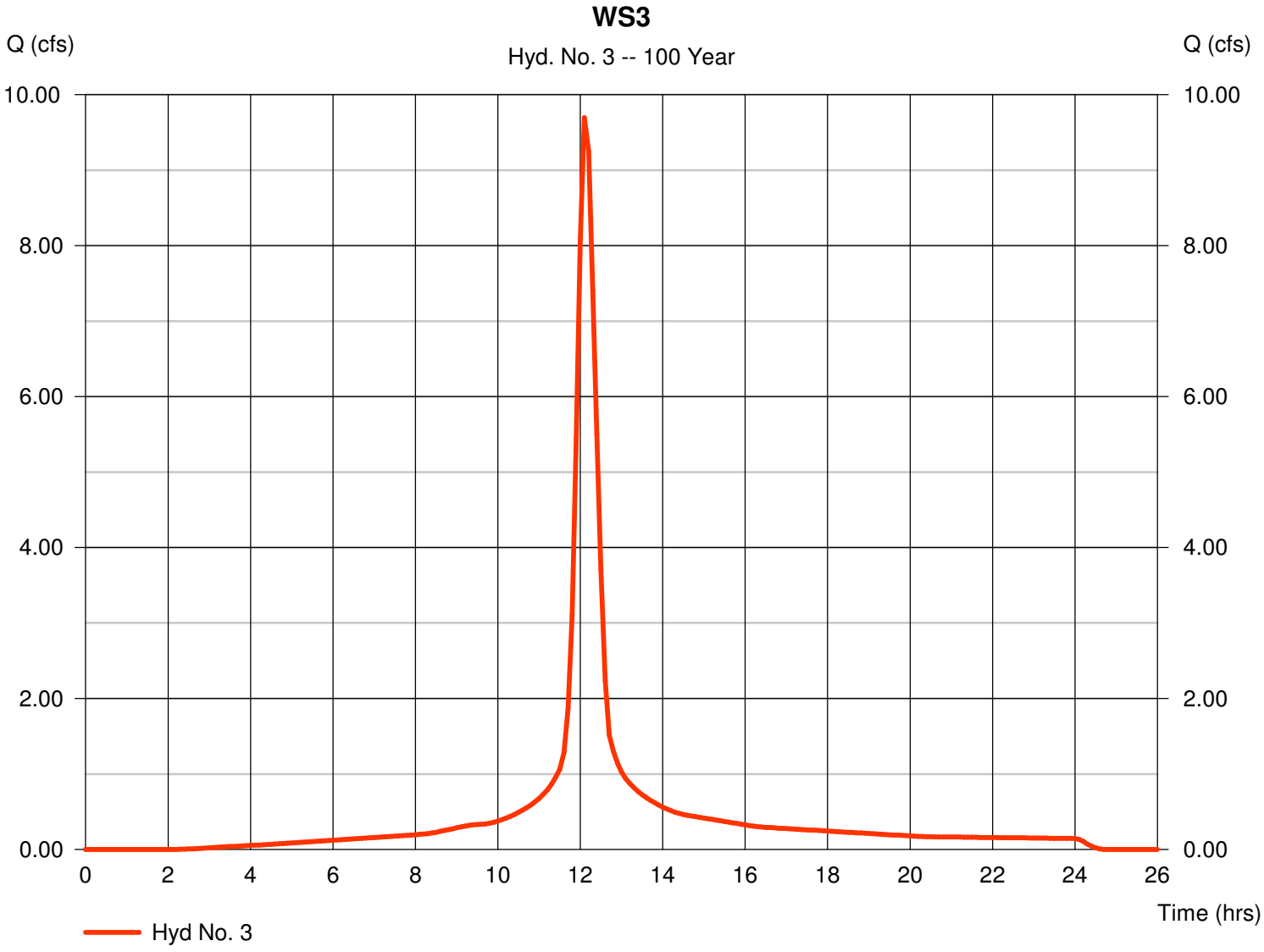


Hydrograph Report

Hyd. No. 3

WS3

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.694 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	6 min	Hyd. volume	=	0.953 acft
Drainage area	=	1.670 ac	Curve number	=	92
Basin Slope	=	0.8 %	Hydraulic length	=	1006 ft
Tc method	=	USER	Time of conc. (Tc)	=	22.90 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

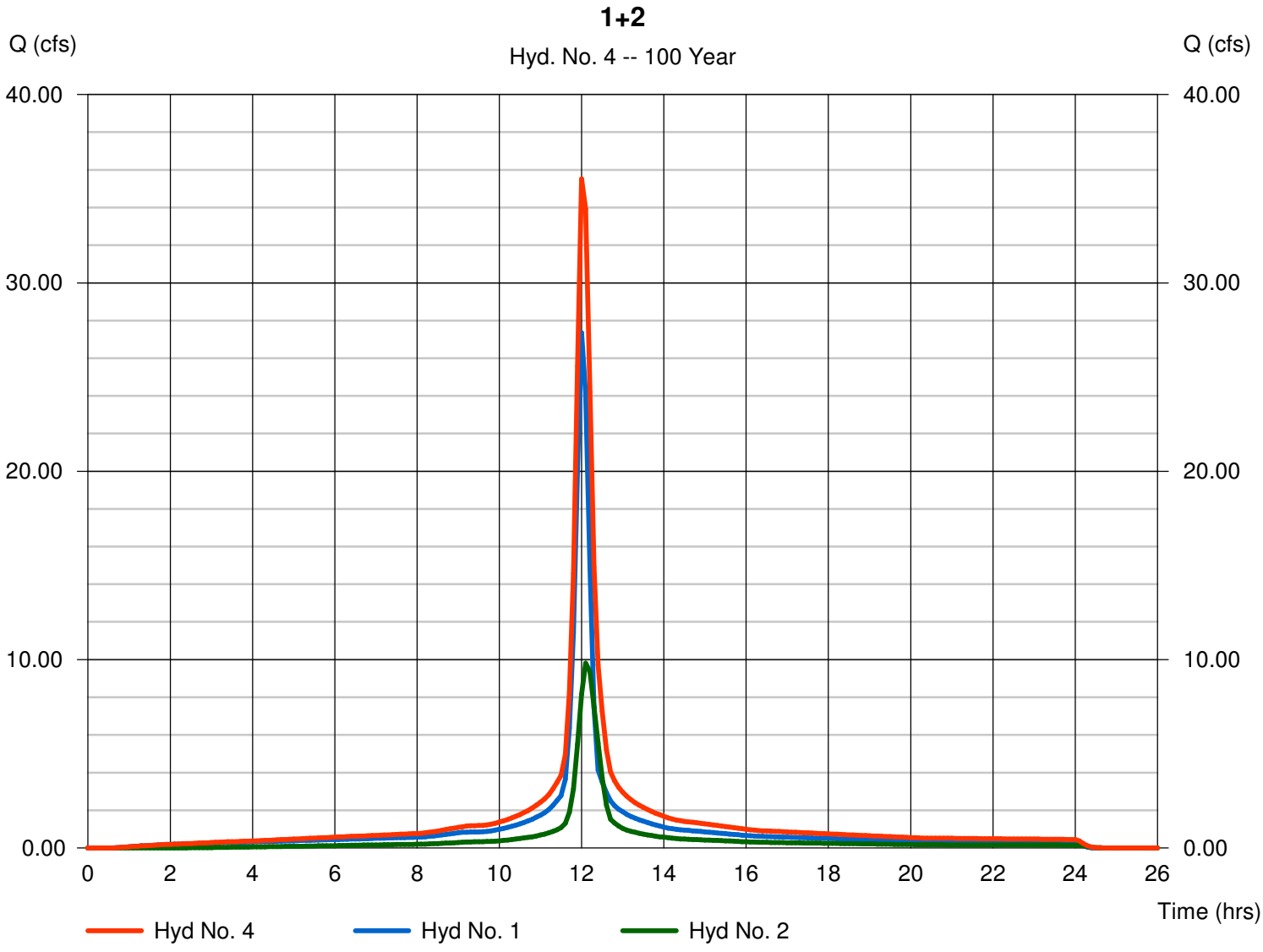


Hydrograph Report

Hyd. No. 4

1+2

Hydrograph type	= Combine	Peak discharge	= 35.52 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 6 min	Hyd. volume	= 3.149 acft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 5.390 ac

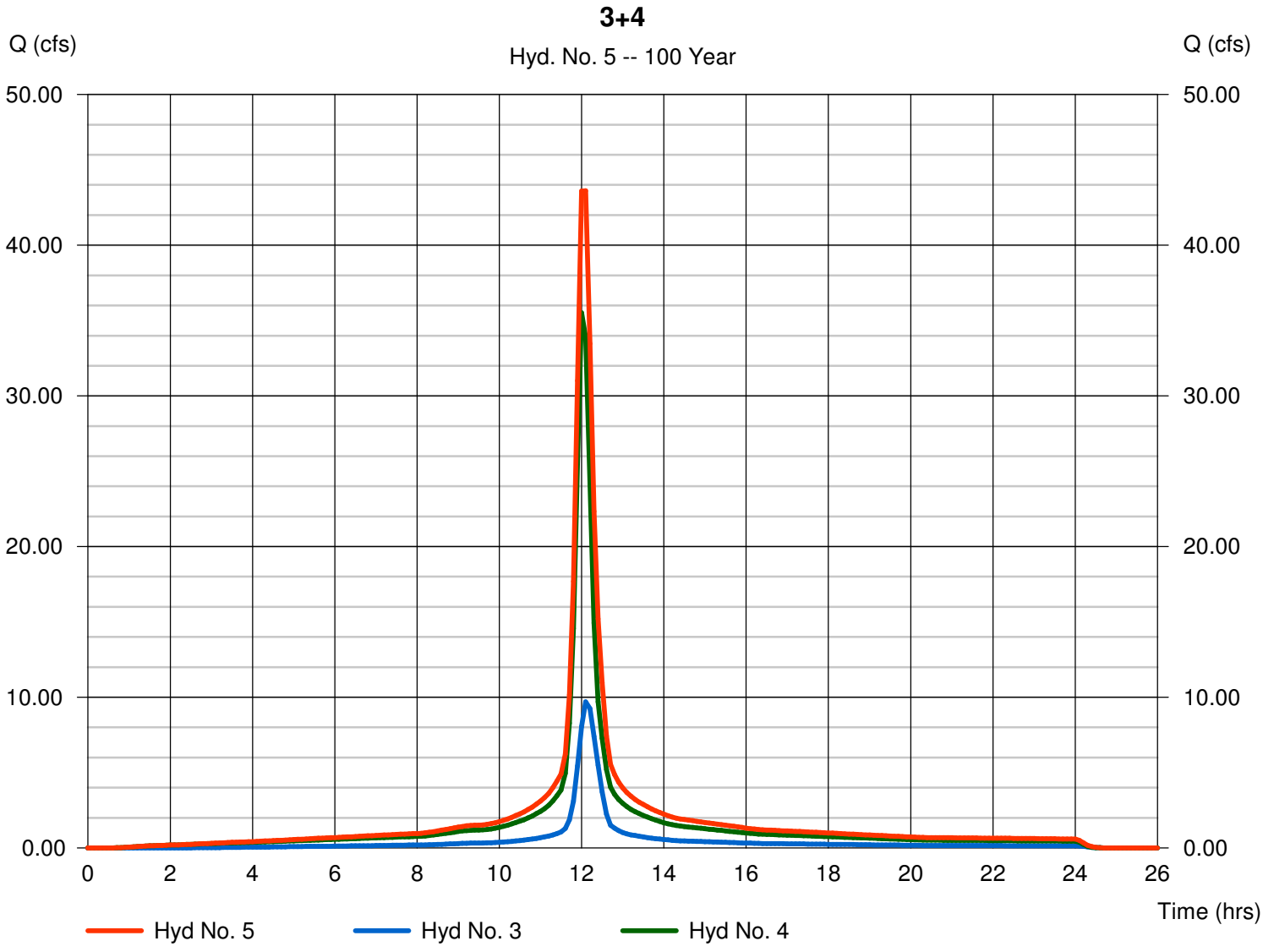


Hydrograph Report

Hyd. No. 5

3+4

Hydrograph type	=	Combine	Peak discharge	=	43.61 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	6 min	Hyd. volume	=	4.102 acft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	1.670 ac

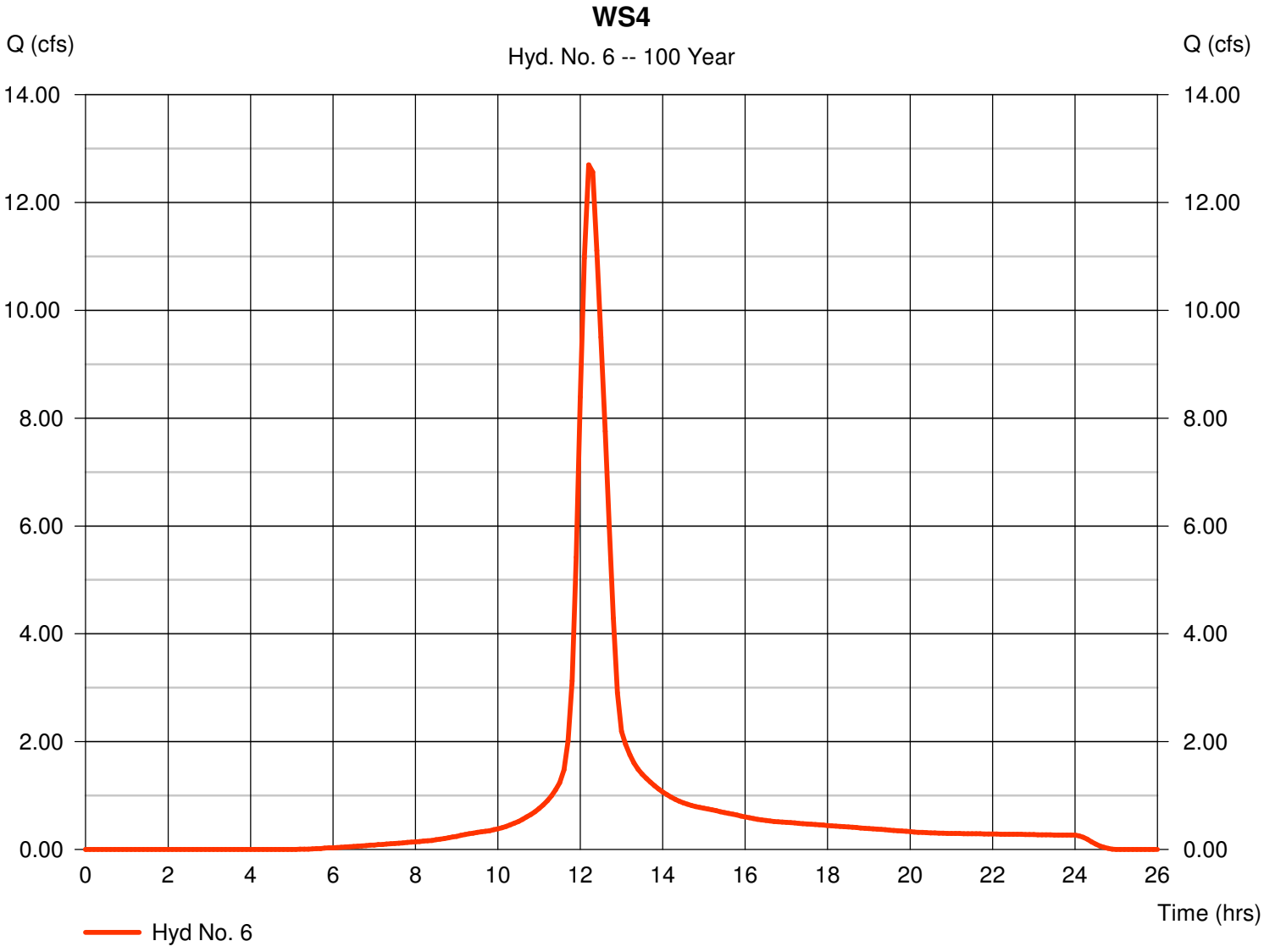


Hydrograph Report

Hyd. No. 6

WS4

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.70 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	1.470 acft
Drainage area	=	3.080 ac	Curve number	=	81
Basin Slope	=	0.8 %	Hydraulic length	=	968 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.40 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

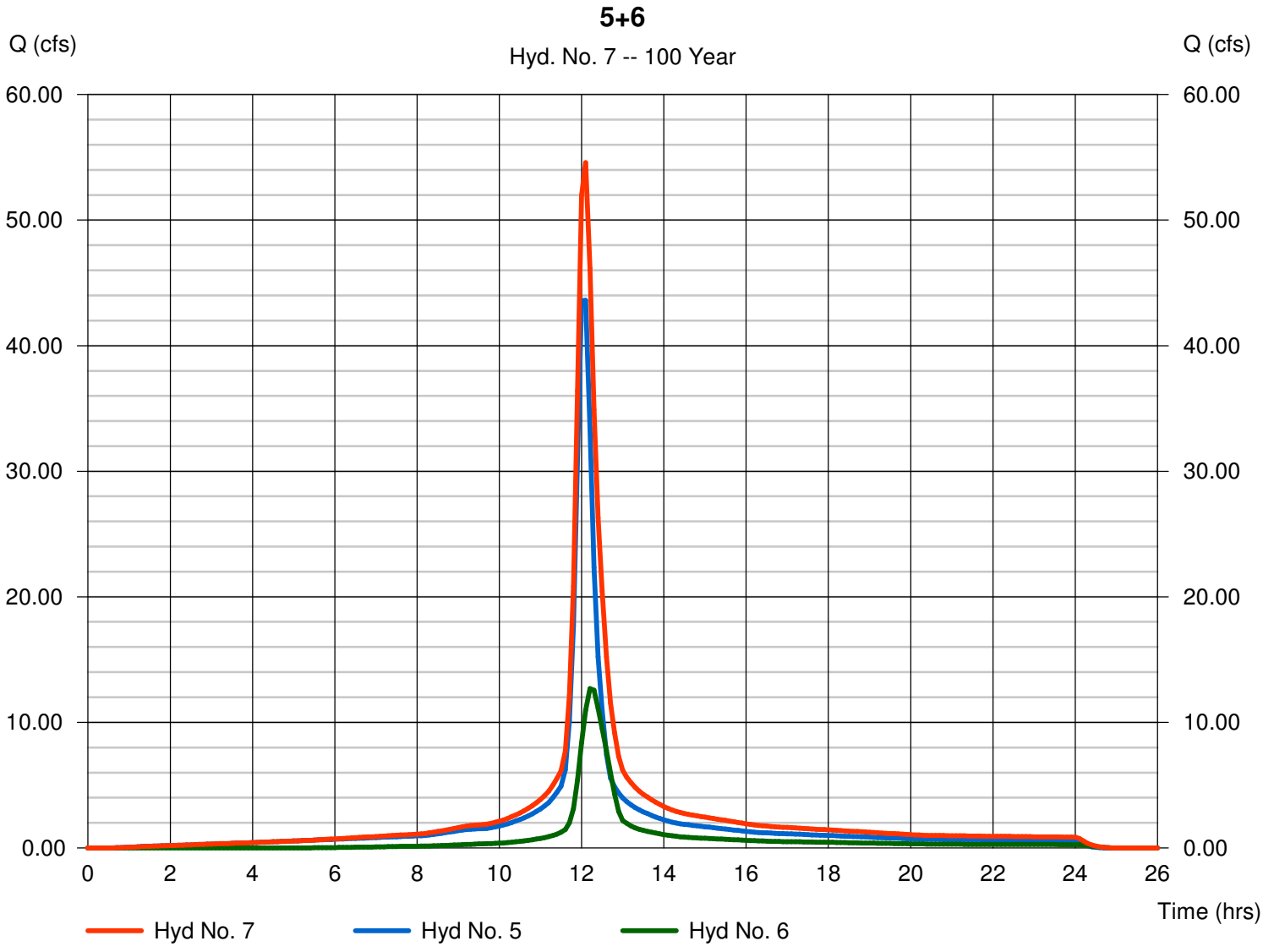


Hydrograph Report

Hyd. No. 7

5+6

Hydrograph type	= Combine	Peak discharge	= 54.58 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 6 min	Hyd. volume	= 5.572 acft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 3.080 ac

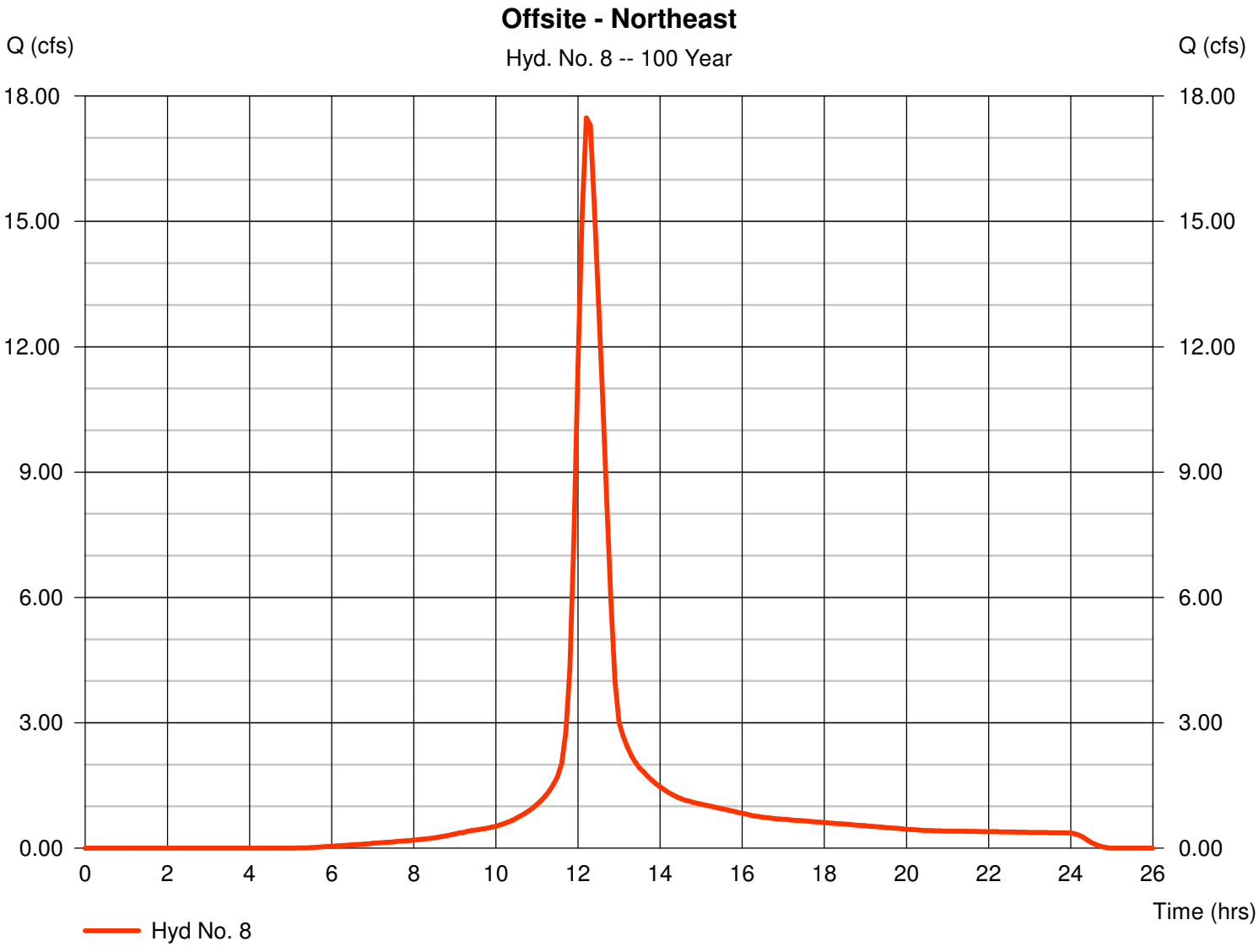


Hydrograph Report

Hyd. No. 8

Offsite - Northeast

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.48 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	2.024 acft
Drainage area	=	4.240 ac	Curve number	=	81
Basin Slope	=	1.6 %	Hydraulic length	=	887 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



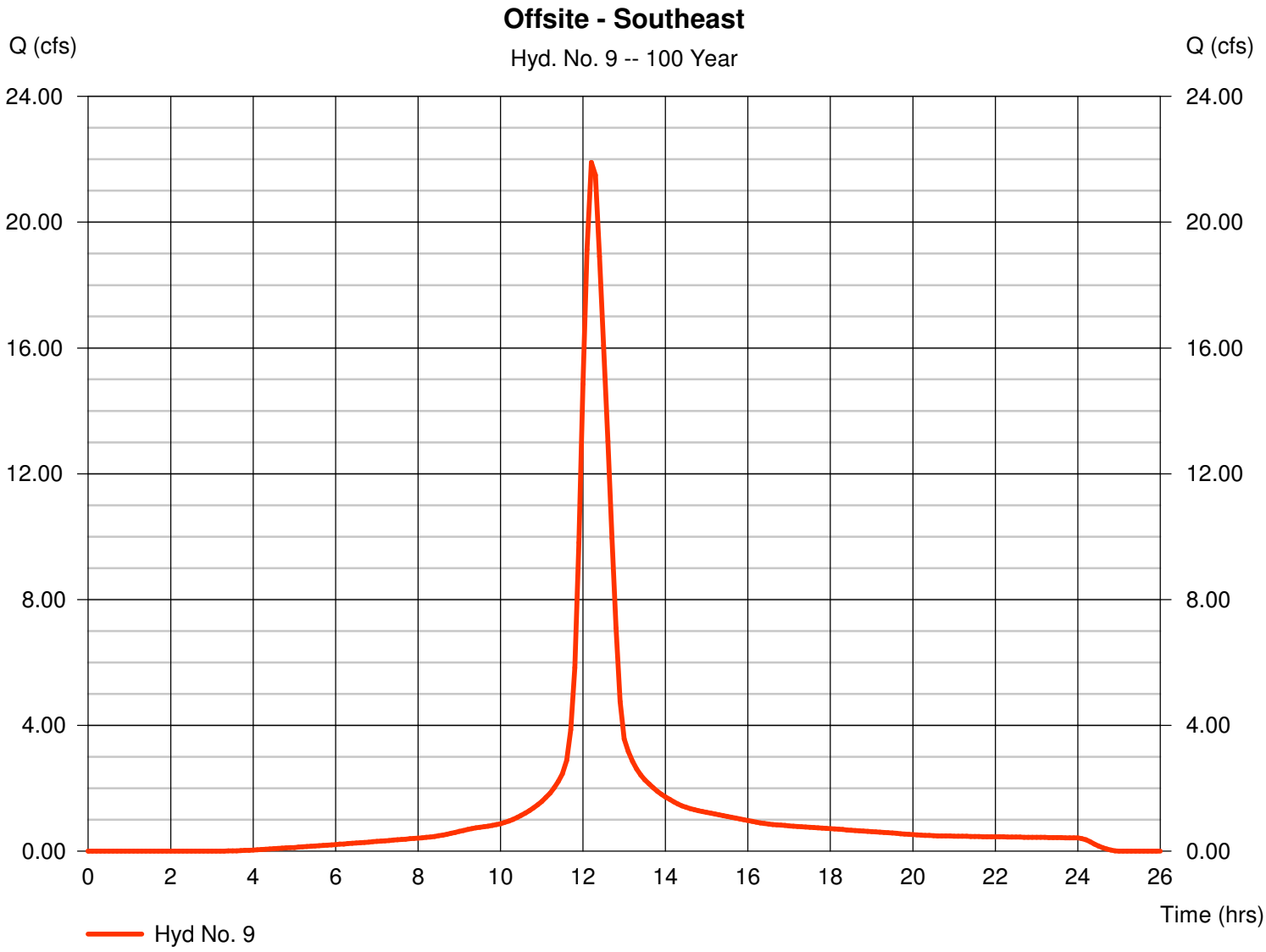
Hydrograph Report

Hyd. No. 9

Offsite - Southeast

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	2.590 acft
Drainage area	=	4.730 ac	Curve number	=	88*
Basin Slope	=	0.9 %	Hydraulic length	=	1224 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.950 x 81) + (1.780 x 98)] / 4.730

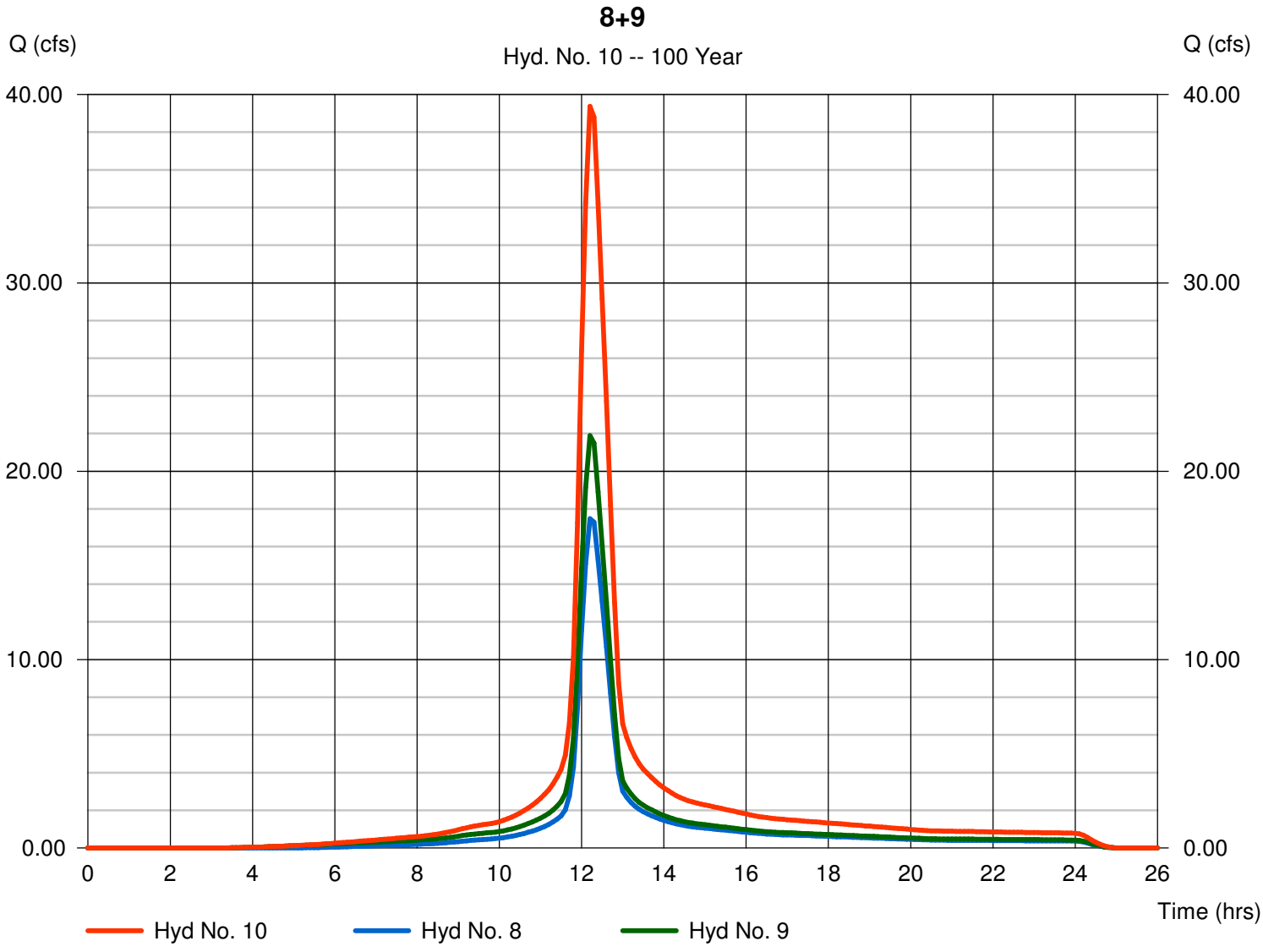


Hydrograph Report

Hyd. No. 10

8+9

Hydrograph type	=	Combine	Peak discharge	=	39.37 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	4.614 acft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	8.970 ac

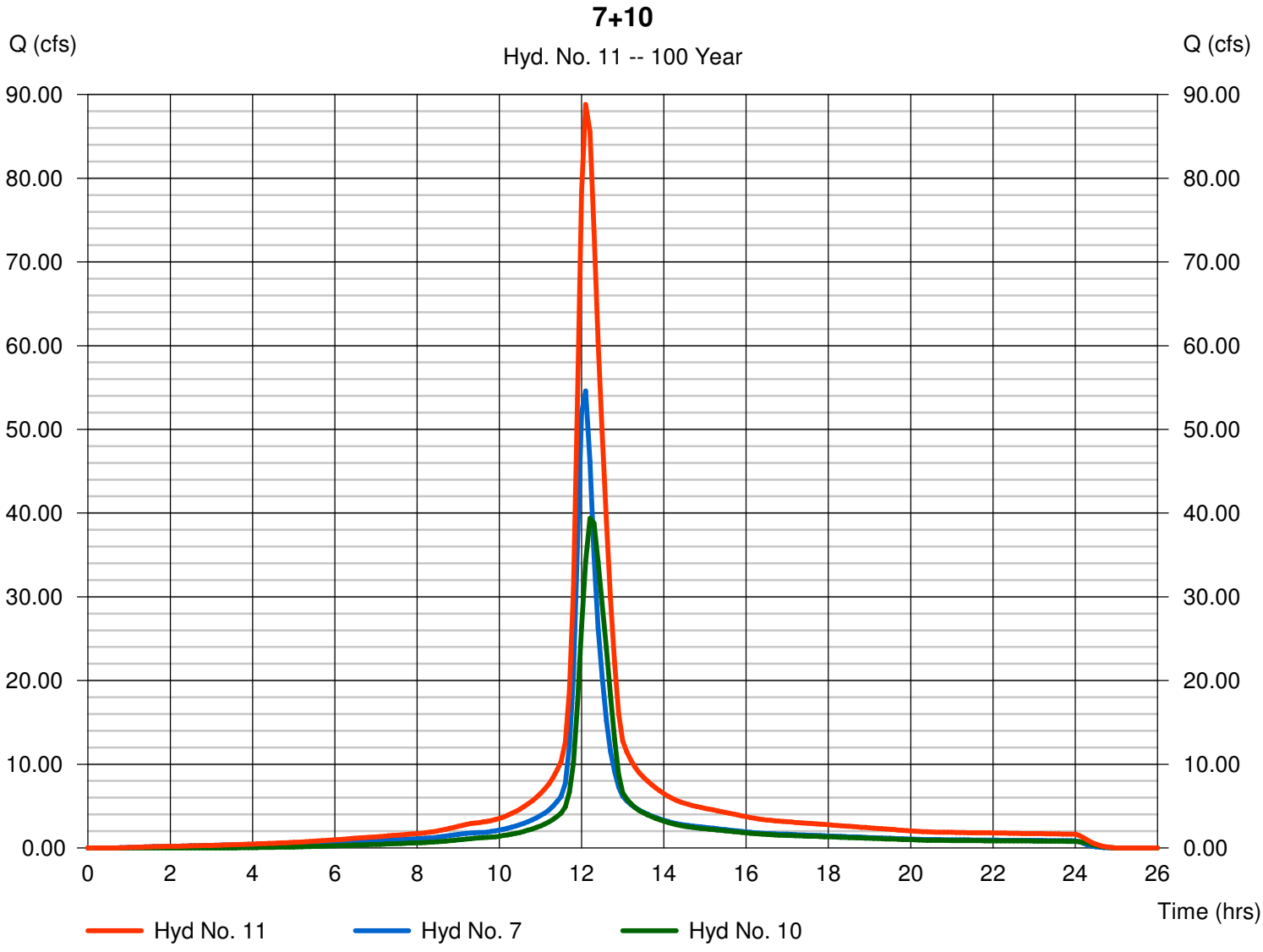


Hydrograph Report

Hyd. No. 11

7+10

Hydrograph type	=	Combine	Peak discharge	=	88.82 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	6 min	Hyd. volume	=	10.186 acft
Inflow hyds.	=	7, 10	Contrib. drain. area	=	0.000 ac



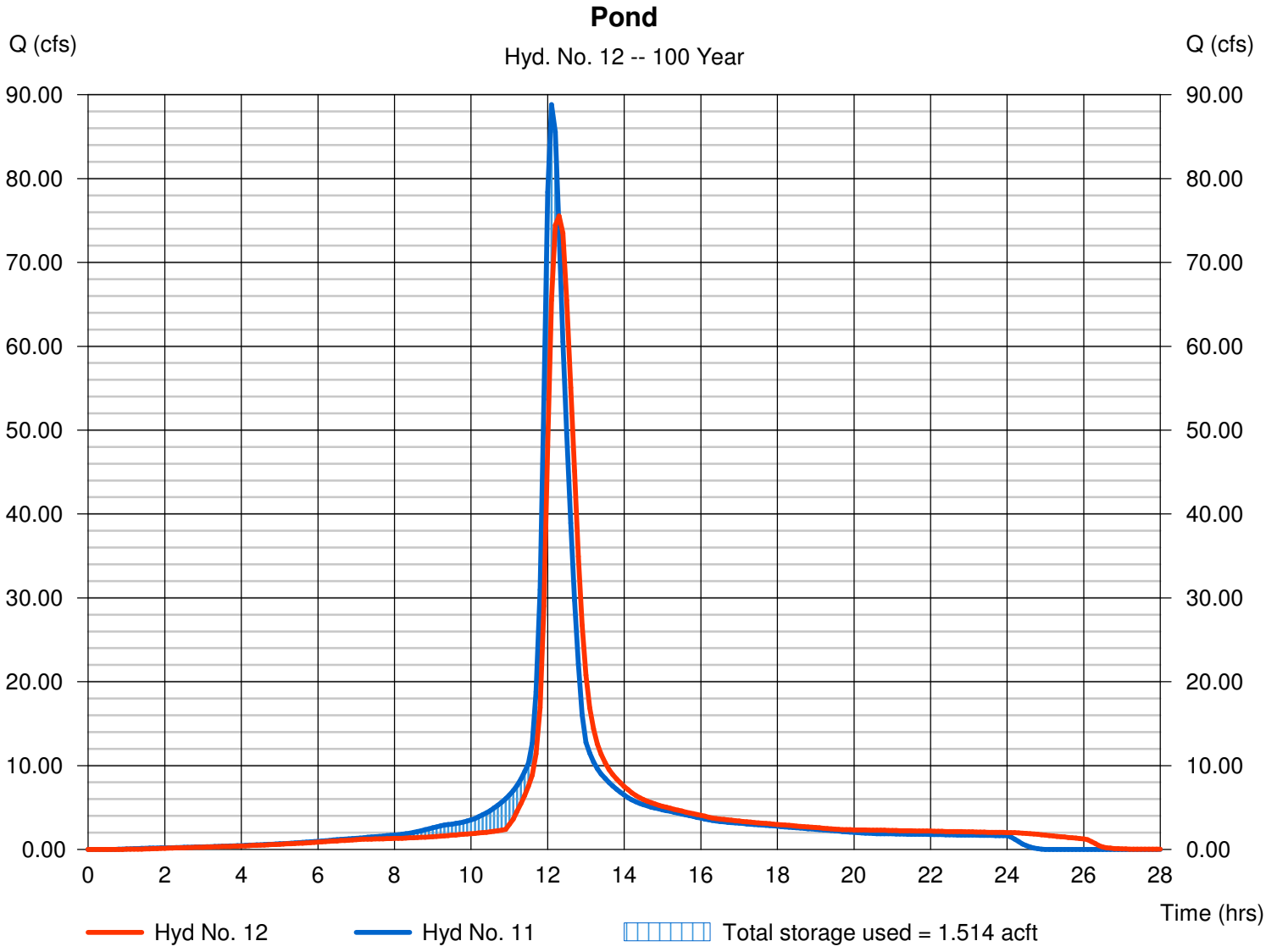
Hydrograph Report

Hyd. No. 12

Pond

Hydrograph type	=	Reservoir	Peak discharge	=	75.53 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	6 min	Hyd. volume	=	10.186 acft
Inflow hyd. No.	=	11 - 7+10	Max. Elevation	=	1347.57 ft
Reservoir name	=	Dry Detention Pond	Max. Storage	=	1.514 acft

Storage Indication method used.



Pond Report

Pond No. 1 - Dry Detention Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1344.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1344.50	10	0.000	0.000
0.50	1345.00	9,188	0.036	0.036
1.50	1346.00	24,237	0.370	0.406
2.50	1347.00	31,388	0.637	1.043
3.50	1348.00	41,592	0.835	1.878
4.50	1349.00	29,322	0.810	2.688
5.50	1350.00	28,079	0.659	3.346

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	5.00	0.00	0.00
No. Barrels	= 1	4	0	0
Invert El. (ft)	= 1340.00	1344.50	0.00	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

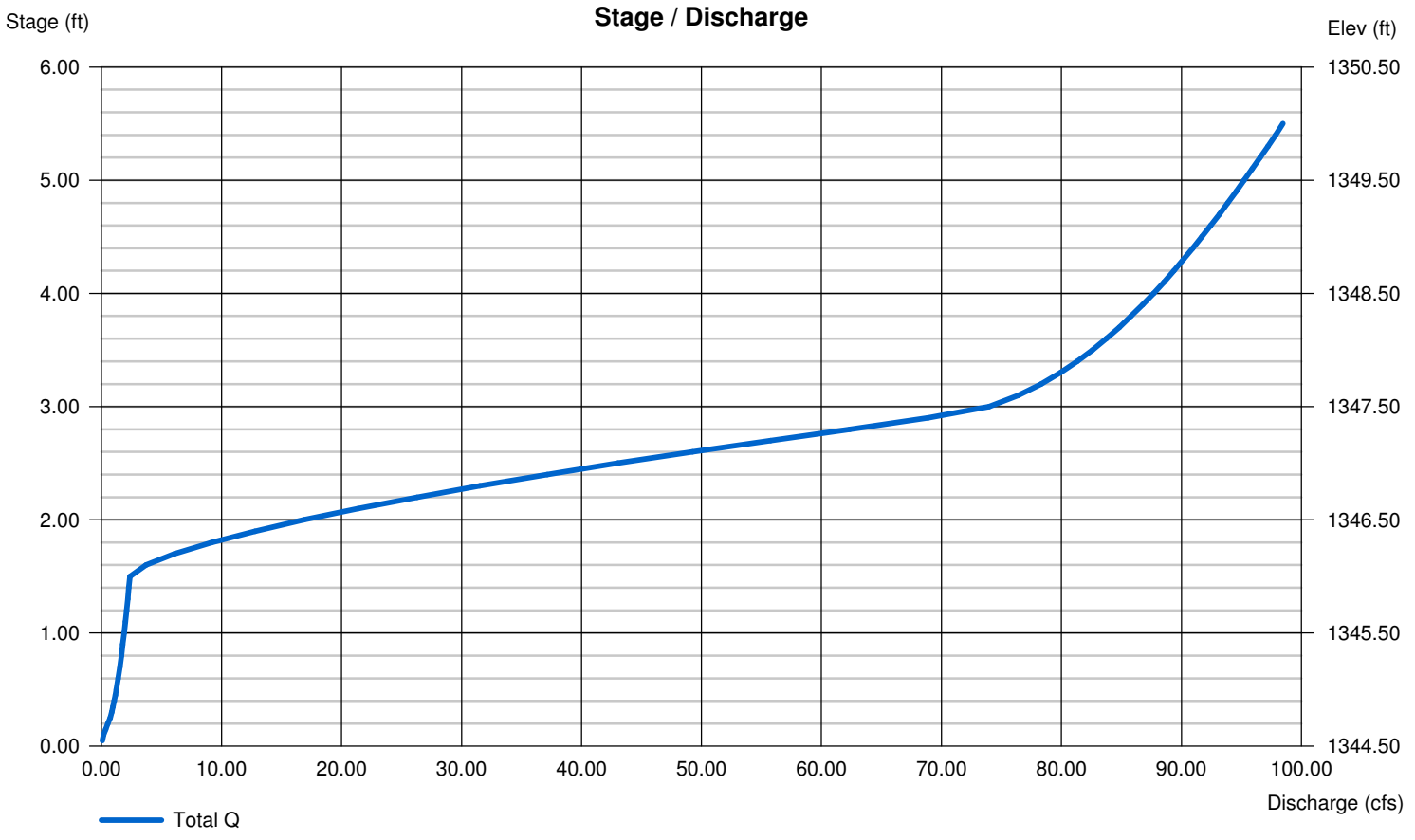
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.00	0.00	0.00	0.00
Crest El. (ft)	= 1346.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	76.3137	14.3000	0.8844	--------
3	0.0000	0.0000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: SedgwickCoKS.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: SedgwickCoKS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.48	0.00	4.55	5.25	6.30	7.10	7.80
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	2.50	0.00	0.00	0.00	4.60	5.20	5.90

Figure 3.3

Time of Concentration and Curve Number Calculations

Time of Concentration Calculations by the FAA method

Cedar View Village

Project Number 6189

$$T_c = \frac{(1.1-C)L^{1/2}}{100\ S^{1/3}}$$

Area Name	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Flow Length (L)	Rational Runoff Coefficient, C				Time of Concentration (min), T_c				Time of Concentration (hr), T_c				CN
						2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	
Pre-Project																		
WS1	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*700*	0.24	0.29	0.39	0.59	36.4	34.3	30.0	21.6	0.6061	0.5709	0.5004	0.3594	81.0
WS2	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.5*	*0.0*	*980*	0.24	0.29	0.39	0.59	47.4	44.6	39.1	28.1	0.7893	0.7434	0.6516	0.4681	82.0
WS3	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*625*	0.24	0.29	0.39	0.59	33.1	31.2	27.3	19.6	0.5515	0.5194	0.4553	0.3270	82.0
Offsite NE	*Agricultural - Cultivated - Slopes <1%*	*D*	*12.0*	*0.0*	*1030*	0.24	0.29	0.39	0.59	47.2	44.5	39.0	28.0	0.7869	0.7412	0.6497	0.4667	81.0
Offsite SE	*Agricultural - Pasture - Slopes 1-4%*	*D*	*11.0*	*0.0*	*1150*	0.32	0.37	0.47	0.67	48.3	45.2	39.0	26.6	0.8054	0.7538	0.6505	0.4440	88.0
Post-Project																		
WS1	*Drive, Parking Lots & Walks*	*D*	*8.0*	*0.0*	*930*	0.87	0.87	0.88	0.89	15.0	15.0	15.0	15.0	0.2500	0.2500	0.2500	0.2500	98.0
WS2	*Residential - Multi-Family - Multi-Unit (attached)*	*D*	*5.0*	*0.0*	*880*	0.64	0.68	0.73	0.83	29.7	27.1	23.9	17.4	0.4943	0.4513	0.3976	0.2901	92.0
WS3	*Residential - Multi-Family - Multi-Unit (attached)*	*D*	*8.0*	*0.0*	*1010*	0.64	0.68	0.73	0.83	28.4	26.0	22.9	16.7	0.4740	0.4328	0.3813	0.2782	92.0
WS4	*Agricultural - Cultivated - Slopes <1%*	*D*	*10.0*	*0.0*	*970*	0.24	0.29	0.39	0.59	47.7	45.0	39.4	28.3	0.7954	0.7492	0.6567	0.4717	81.0
Offsite NE	*Agricultural - Cultivated - Slopes <1%*	*D*	*14.0*	*0.0*	*890*	0.24	0.29	0.39	0.59	39.7	37.4	32.8	23.5	0.6618	0.6233	0.5464	0.3925	81.0
Offsite SE	*Agricultural - Pasture - Slopes 1-4%*	*D*	*11.0*	*0.0*	*1150*	0.32	0.37	0.47	0.67	48.3	45.2	39.0	26.6	0.8054	0.7538	0.6505	0.4440	88.0

Tab 4. Floodplain Submittal

Not applicable to Cedar View Village.

Tab 5. Permits

A. US Army Corps of Engineers

Not applicable to Cedar View Village.

B. Kansas Department of Agriculture

Not applicable to Cedar View Village.

C. Federal Emergency Agency (FEMA)

Not applicable to Cedar View Village.

D. Kansas Department of Transportation

Not applicable to Cedar View Village.

E. Sedgwick County Right-of-way Permit

Not applicable to Cedar View Village.